

IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

Priority sites for Conservation

Revised and updated 2nd Edition Vol. II



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**Second Edition: Revised and Updated
Volume II**

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UTTAR PRADESH



SHASWANG MEHTA

Sarus is the state bird of Uttar Pradesh and traditionally protected by villagers. There is no case of hunting of Sarus but incidental or intentional poisoning cases are frequently reported

INTRODUCTION

The state of Uttar Pradesh (23° 52' - 30° 24' N; 77° 5' - 84° 38' E) spreads over 2, 40,972 sq. km, and comprises 7.33% of the country's total landmass. The state is surrounded by Uttarakhand and Nepal to the north, Haryana and Delhi to the west, Rajasthan to the south-west, Madhya Pradesh to the south and south-west and Bihar to the east. It was created on April 1, 1937 as the United Provinces, and was renamed Uttar Pradesh in 1950. The state has a very ancient and interesting history. Many of the great sages of Vedic times including Bharadwaja, Yajnavalkya, Vashishta, Vishvamitra, and Valmiki lived in Uttar Pradesh. Many sacred books were also composed here. *Varsha Purana*, for example, is associated with Mathura. The sacred place of Naimisharanya in Sitapur district is where the sage Maharshi Vyas edited the Vedas and also where the Puranas were composed. Two great epics of India, the *Ramayana* and the *Mahabharata* have references to places in Uttar Pradesh. The *Mahabharata* tells the story of the royal family at Hastinapur, an ancient city located north-west of the state.

Uttar Pradesh is one of the most populous states of India. According to a report, the human population of the state was estimated at 166.1 million in the year 2001 and increased by 25.8% during the last decade. Its population density

increased rapidly, from 300 persons per km² in 1971 to 689 per sq. km in 2001 and 828 per sq. km in 2011.

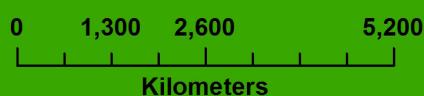
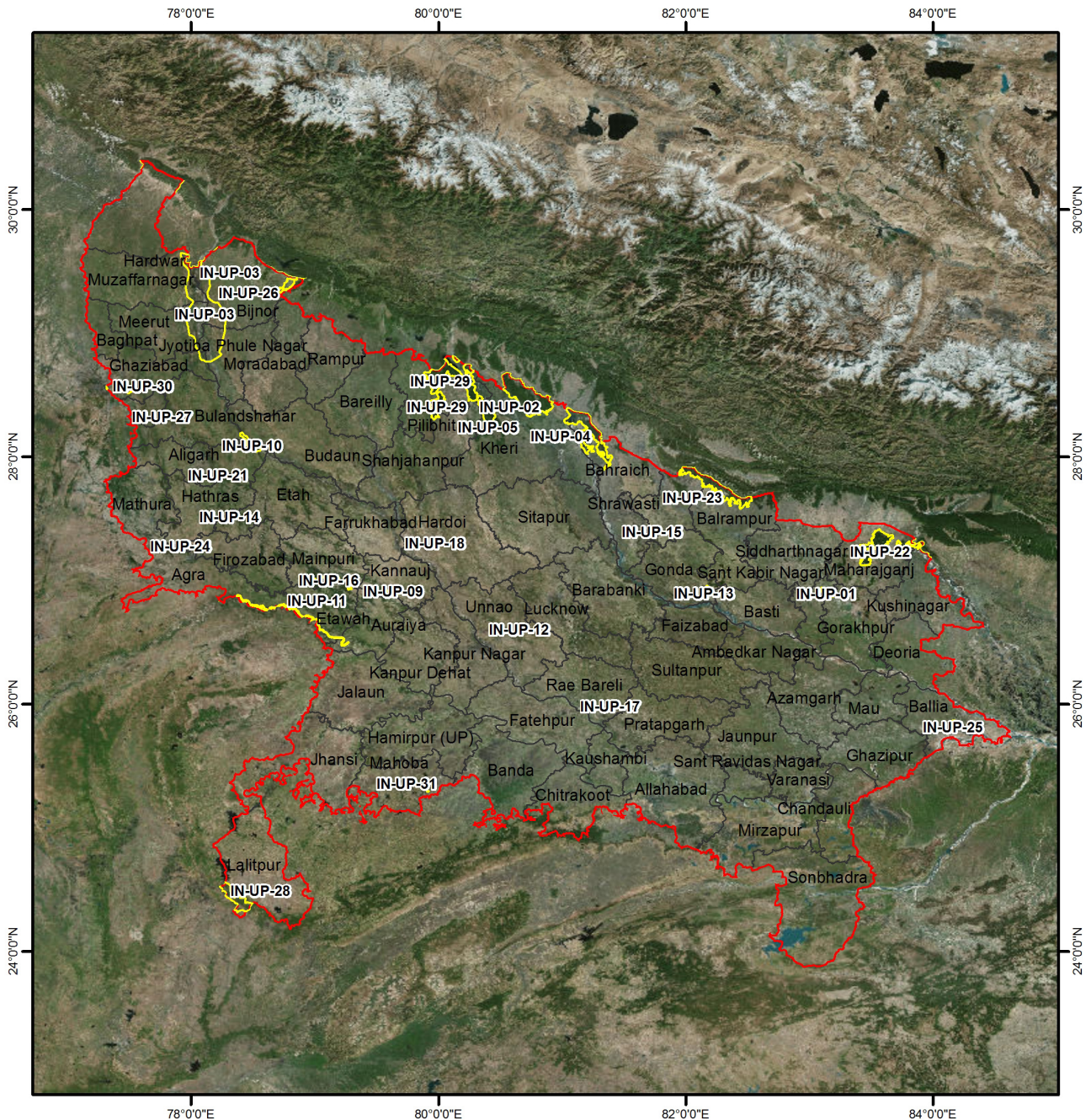
Uttar Pradesh is the largest producer of food grains and oilseeds in the country. The state leads in the production of wheat, maize, barley, grain, sugarcane and potatoes. Cities like Agra (famous for the Taj Mahal, Agra Fort, and nearby Fatehpur Sikri), Allahabad (confluence of the sacred rivers Ganga, Yamuna, and Saraswati, where Kumbha, the world's largest religious fair is held), Lucknow (seat of the Nawabs of Awadh and historical monuments), and Varanasi (Hindu pilgrimage and sacred places) have a strong historical and religious presence and international importance. Dudhwa National Park is the only national park of the state. It is also recognized as an Important Bird Area.

Geographical Profile

Uttar Pradesh has a tropical climate with a wide temperature fluctuation from less than 2 °C to 48 °C. There are three main seasons: summer from March to mid-June; the rainy season from mid-June to September; and winter from October to February. There is a great variation in rainfall. The *bhabhar* area has rainfall from 1,300 to 1,900 mm, whereas in the *terai* area it varies from 1,200 to 2,500 mm. In the Gangetic plains, the rainfall varies from 600 to 1200 mm.

Important Bird Areas in Uttar Pradesh

IN-UP





After separation of Uttarakhand in 2000 from Uttar Pradesh, Dudhwa is now the only national park left in the state. It is well-protected by the Forest Department. Asiatic Elephant first seen in early 1990s occasionally, now permanently resides in the Park

Vegetation

Regarding their legal status, Reserved Forests constitute 65.9%, Protected Forests 14.4% and Un-classed Forests 19.7% (Ministry of Environment and Forests 2001). There are three forest types, namely Tropical Moist Deciduous, Tropical Dry Deciduous, and Tropical Thorn. Sal is an important forest formation of the State. Forests are distributed largely in the northern and partly in the southern parts of the State. The central part is devoid of forest vegetation as it is mainly under agriculture. A forest cover increase was recorded by the Forest Survey of India report of 1999 in the districts of Hardoi, Lakhimpur-Kheri, and Saharanpur, because plantation was under taken four to five years earlier and also due to effective protection measures. A decrease in forest cover was observed in the districts of Banda, Jhansi, Mirzapur, and Sonbhadra, which was largely on account of biotic pressures. According to the Forest Survey of India report of 2001, the recorded forest area in the state is 16,826,000 ha, about 2.2% of India's forest and 7% of the state's geographical area.

Prime Eco Zones

Uttar Pradesh has three main physiographic regions, namely the submontane region lying between the Himalaya and the plains, the vast alluvial Gangetic plains, and the southern hills and plateau. The state is fed by five major

rivers: Ganga, Yamuna, Ramganga, Gomti, and Ghaghra. More than one-fourth of Uttar Pradesh lies within the Gangetic plains which consist of alluvial deposits brought down from the Himalaya by the Ganga, Yamuna and their tributaries. All the rivers except the Gomti and the Chambal emerge from the Himalaya. The southern hills form part of the Vindhya ranges whose elevation rarely exceeds 300 m.

The Terai

The Terai ecosystem is one of the most diversified and threatened ecosystems in India. It supports many globally threatened bird species such as the Bengal Florican *Houbaropsis bengalensis*, Swamp Francolin *Francolinus gularis*, White-throated Bushchat *Saxicola insignis*, Bristled Grassbird *Chaetornis striata*, and an occasional Lesser Florican *Sypheotides indica*. The region is a vast flat alluvial plain lying between the Himalayan foothills and the Gangetic plains. It forms an integral part of the Terai-Bhabhar bio-geographic subdivision of the upper Gangetic biotic province and the Gangetic Plains bio geographic zone (Rodgers and Panwar 1988)

Terai forest is mainly moist deciduous, and dominated by Sal *Shorea robusta*. A significant attribute of the Sal forest ecosystem is the interspersed swamp, wet tall grasslands, dry grasslands or *phanta* sparsely dominated by Kans grass *Saccharum spontaneum*, Blady grass *Imperata cylindrica*

LIST OF PROTECTED AREAS IN UTTAR PRADESH

Sl. No.	Name of the Protected Areas	Year of Estbl.	Area (sq km)	District (s)
1.	Dudhwa NP	1977	490.00	490.00 Lakhimpur-Kheri
2.	Bakhira WLS	1990	28.94	Sant Kabir Nagar (Basti)
3.	Chandraprabha WLS	1957	78.00	Chandauli
4.	Hastinapur WLS	1986	2073.00	Muzzafar Nagar, Meerut etc
5.	Kaimur WLS	1982	500.73	Mirzapur, Sonbhadra
6.	Katerniaghat WLS	1976	400.09	Bahraich
7.	Kishanpur WLS	1972	227.00	Lakhimpur-Kheri,
8.	Lakh Bahosi WLS	1988	80.24	Shahjahanpur Farrukhabad
9.	Mahavir Swami WLS	1977	5.41	Lalitpur
10.	National Chambal WLS	1979	635.00	Agra, Etawah
11.	Nawabganj WLS	1984	2.25	Unnao/ Lucknow
12.	Okhala WLS	1990	4.00	Ghaziabad
13.	Parvati Aranga WLS	1990	10.84	Gonda
14.	Patna WLS	1990	1.09	Etah
15.	Pilibhit WLS	2014		Pilibhet
16.	Ranipur WLS	1977	230.31	Banda, Chitrakoot
17.	Saman Bird WLS	1990	5.26	Mainpuri
18.	Samaspur WLS	1987	7.99	Rae Bareli
19.	Sandi WLS	1990	3.09	Hardoi
20.	Sohagi Barwa WLS	1987	428.20	Maharajganj
21.	Sohelwa WLS	1988	452.47	Shravasti, Balrampur
22.	Sur Sarovar WLS	1991	4.03	Agra
23.	Surha Tal WLS	1991	34.32	Ballia
24.	Turtle WLS	1989	7.00	Varanasi
25.	Vijai Sagar WLS	1990	2.62	Mahoba

Abbreviations :

National Park (NP), Wildlife Sanctuary (WLS)

*List Compiled as on 24.1.2011 by: Dr. J.S. Kathayat**Source : National Wildlife Database Cell*

and other specific vegetation. Broadly, two types of tall grasslands – the upland grassland and lowland grassland – have been recognized in the Terai region. The former occurs on drier or well-drained soils while the latter type occurs in low lying water-logged sites or areas inundated during the monsoon and subsequent months. The grasses in upland grasslands usually attain a height up to 2 m while grasses in lowland grassland are even 6 m tall. The resulting complex woodland-grassland-wetland ecosystem harbours a vast variety of floral and faunal life. The present extent of grassland forms an integral part of the forest land controlled by the state Forest Department.

Gangetic Plain

The most important area for the economy of the state is the Gangetic plain which stretches across the entire length of the state from west to east. The entire alluvial plain can

be divided into three sub-regions. The first in the eastern tract consisting of 14 districts which are subject to periodical floods and droughts and have been classified as scarcity areas. These districts have the highest density of population and the lowest per capita land. The other two regions, the central and the western are comparatively better with a well-developed irrigation system. They suffer from water logging and large-scale *usar* (so-called wasteland) tracts. The Gangetic plain is watered by the Ganga, Yamuna, Ghaghra, Rapti, and Gandak. The major tributaries draining into these rivers are the Ramganga, Gomti, Hindon, Chambal, Saryu, Sai, Kosi, Betwa, Belan, Dhasan, Tons and Son. Besides the rivers, the state is dotted with numerous waterbodies: lakes, ponds, reservoirs, dams, and canals. Twenty-three Important Bird Areas have been recognised in the Gangetic Plain. The whole plain is alluvial and very fertile. The chief crops cultivated here are rice, wheat, pearl millet, gram, and

IBAs of UTTAR PRADESH		
IBA site codes	IBA site names	IBA criteria
IN-UP-01	Bakhira Wildlife Sanctuary	A1, A4iii
IN-UP-02	Dudhwa National Park	A1, A3
IN-UP-03	Hastinapur Wildlife Sanctuary	A1
IN-UP-04	Katerniaghat Wildlife Sanctuary and Girijapuri Reservoir	A1
IN-UP-05	Kishanpur Wildlife Sanctuary	A1
IN-UP-06	Kudaiyya Marshland	A1, A4iii
IN-UP-07	Kurra Jheel	A1, A4iii
IN-UP-08	Lagga-Bagga Reserve Forest	A1
IN-UP-09	Lakh-Bahosi Wildlife Sanctuary	A1, A4iii
IN-UP-10	Narora	A1, A4iii
IN-UP-11	National Chambal Wildlife Sanctuary	A1, A4iii
IN-UP-12	Nawabganj Bird Sanctuary	A1, A4iii
IN-UP-13	Parvati Aranga Wildlife Sanctuary	A1, A4iii
IN-UP-14	Patna Vihar Bird Sanctuary	A1, A4i, A4iii
IN-UP-15	Pyagpur (Baghetal) and Sitadwar Jheel	A1, A4iii
IN-UP-16	Saman Bird Sanctuary	A1, A4i, A4iii
IN-UP-17	Samaspur Bird Sanctuary	A1, A4i, A4iii
IN-UP-18	Sandi Bird Sanctuary	A1, A4i, A4iii
IN-UP-19	Sarsai Nawar Lake	A1, A4i, A4iii
IN-UP-20	Sauj Lake	A1, A4i, A4iii
IN-UP-21	Sheikha Jheel	A1, A4i, A4iii
IN-UP-22	Sohagibarwa Wildlife Sanctuary	A1
IN-UP-23	Soheldev Wildlife Sanctuary	A1
IN-UP-24	Sur Sarovar Bird Sanctuary	A1, A4iii
IN-UP-25	Surha Taal Wildlife Sanctuary	A1, A4i, A4iii
IN-UP-26	Amangarh Reserve Forest	A1
IN-UP-27	Dhanauri Wetland	A1, A4i, A4iii
IN-UP-28	Mahaveer Swami Wildlife Sanctuary (Lalitpur)	A1, A4i, A4iii
IN-UP-29	Pilibhet Tiger Reserve	A1
IN-UP-30	Surajpur Wetland	A1, A4i, A4iii
IN-UP-31	Vijay Sagar Wildlife Sanctuary	A1, A4i, A4iii

barley. Sugar cane is the chief cash crop of the region.

Southern hills and Plateau

The southern fringe of the Gangetic plain, from west to east, is demarcated by the Vindhya hills and plateau. It comprises four districts: Jhansi, Jalaun, Banda, and Hamirpur in Bundelkhand area, Meja and Karchhana *tehsils* of Allahabad district, and the whole of Mirzapur district south of Ganga and Chakia *tehsil* of Chandauli district. The terrain is stony with low hills. The Betwa and Ken rivers join the Yamuna from the south-west in this region. It has four distinct kinds of soil, two of which are agriculturally difficult to manage. Rainfall is scanty and erratic, and water resources are scarce. Dry farming is practiced on a large scale.

Important Bird and Biodiversity Areas of Uttar Pradesh

In 2004, BNHS and BirdLife International recognized 466 IBAs in India (Islam & Rahmani 2004), out of which 25 were found in Uttar Pradesh. During the last ten years, many more sites have come to our notice that fulfills one or more IBA criteria. In this edition of the book, we have added six new IBAs. We have to leave out five sites as bird information was inadequate.

Bird life of Uttar Pradesh

The bird life of Uttar Pradesh is rich and varied. More than 500 species are found, including some extremely rare ones. BirdLife International (2014) has listed 17 Critically Endangered species in India, of which five are found in Uttar Pradesh: White-rumped Vulture *Gyps bengalensis*, Long-billed Vulture *G. indicus*, Slender-billed Vulture *G. tenuirostris*, Red-headed Vulture *Sarcogyps calvus*, and Bengal Florican *Houbaropsis bengalensis*. Similarly, out

DISTRIBUTION OF THREATENED BIRDS IN THE STATE WITH IBA SITE CODE

Common Name	Scientific Name	IBA Site Code
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CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>	IN-UP-02,03, 04, 05, 06, 10, 11, 14, 21, 22, 23, 26, 28, 29, 31, IN-DL-01
Long-billed Vulture	<i>Gyps indicus</i>	IN-UP-03, 04, 10, 11, 14, 21, 22, 23, 28, IN-DL-01
Slender-billed Vulture	<i>Gyps tenuirostris</i>	IN-UP-02, 04, 05, 26, 29
Red-headed Vulture	<i>Sarcogyps calvus</i>	IN-UP-02, 03, 04, 05, 08, 09, 11, 23, 26, 28, 29
Bengal Florican	<i>Houbaropsis bengalensis</i>	IN-UP-02, 04, 05, 08, 29
Sociable Lapwing	<i>Vanellus gregarious</i>	IN-UP-07 (occasional)

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>	IN-UP- 03, 04, 05, 06, 09, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23,24, 25, 28, 29, 30, 31, IN-DL-01
Saker Falcon	<i>Falco cherrug</i>	IN-UP-03
Baer's Pochard	<i>Aythya baeri</i>	IN-DL-01
Lesser Florican	<i>Sypheotides indica</i>	IN-UP-02
Black-bellied Tern	<i>Sterna acuticauda</i>	IN-UP-02, 03, 04, 05, 09, 10, 11, 14, 17, 18, 21, 23, 26, IN-DL-01

VULNERABLE

Dalmatian Pelican	<i>Pelecanus crispus</i>	IN-UP-11 (?)
Swamp Francolin	<i>Francolinus gularis</i>	IN-UP-02, 03 (?), 04, 05, 08, 22, 23, 29
Marbled Teal	<i>Marmaronetta angustirostris</i>	IN-UP-02
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>	IN-UP-02, 03, 04, 05, 09, 10, 11, 17, 18, 26, IN-DL-01
Eastern Imperial Eagle	<i>Aquila heliaca</i>	IN-UP-02, 26
Greater Spotted Eagle	<i>Aquila clanga</i>	IN-UP-02, 03, 04, 05, 07, 09, 10, 11, 12, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 27, 30, IN-DL-01
Indian Spotted Eagle	<i>Aquila hastata</i>	IN-UP-11, IN-DL-01
Asian Woollyneck	<i>Ciconia episcopus</i>	IN-UP-02, 03, 04, 05, 06, 11, 12, 14, 19, 20, 21, 22, 29
Lesser Adjutant	<i>Leptoptilos javanicus</i>	IN-UP-02, 04, 05, 06, 12, 22, 24, 26, 29, IN-DL-01
Sarus Crane	<i>Grus antigone</i>	IN-UP-01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, IN-DL-01
Indian Skimmer	<i>Rynchops albicollis</i>	IN-UP-03, 10, 11, IN-DL-01
Yellow-eyed Pigeon	<i>Columba eversmanni</i>	IN-UP-03
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>	IN-UP-02,04, 05, 22, 23, 26
Bristled Grassbird	<i>Chaetornis striata</i>	IN-UP 02, 03, 28, 30, IN-DL-01
Yellow-breasted Bunting	<i>Emberiza aureola</i>	IN-UP-23
Yellow or Finn's Weaver	<i>Ploceus megarhynchus</i>	IN-UP-03 (?), 07 (?), 08 (?), IN-DL-01

NEAR THREATENED

Falcated Duck	<i>Anas falcata</i>	IN-UP-02, 04, 05, 07
Ferruginous Pochard	<i>Aythya nyroca</i>	IN-UP-02, 03, 04, 05, 06, 09, 10, 11, 12, 14, 15, 17, 18, 21, 22, 23, 25, 26, 30, 31, IN-DL-01,
Lesser Flamingo	<i>Phoenicopterus minor</i>	IN-UP-14, 21, 24
Painted Stork	<i>Mycteria leucocephala</i>	IN-UP-02, 03, 04, 05, 06, 07, 09, 10, 11, 12, 14, 15, 17, 18, 19, 20, 21, 23, 24, 26, 27, 28, 29, 31, IN-DL-01,
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	IN-UP-02, 03, 04, 05, 06, 07, 09, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 26, 27, 29, 30, IN-DL-01
Black-headed Ibis	<i>Threskiornis melanocephalus</i>	IN-UP-02, 03, 04, 05, 06, 07, 09, 10, 11,12, 14, 17, 18, 21, 22, 23, 24, 25, 26, 27, 29, 30, IN-DL-01
Spot-billed Pelican	<i>Pelecanus philippensis</i>	IN-UP-02, 09, 11, 14, 24
Oriental Darter	<i>Anhinga melanogaster</i>	IN-UP-01,02, 03, 04, 05, 06, 07, 09, 10, 11,12, 14, 17, 18, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, IN-DL-01
Laggar Falcon	<i>Falco jugger</i>	IN-UP-02, 03, 04, 05, 11, 29
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>	IN-UP-02, 04, 05, 22, 26, IN-DL-01

NEAR THREATENED (contd.)		
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>	IN-UP-02, 04, 05, 11, 21, 22, 23, 24, 26, 29
Cinereous Vulture	<i>Aegypius monachus</i>	IN-UP-02, 04, 05, 11, 23, 26, 28
Himalayan Griffon	<i>Gyps himalayensis</i>	IN-UP-02, 04, 05, 11, 14, 21, 22, 29
Pallid Harrier	<i>Circus macrourus</i>	IN-UP-02, 03 (?), 04, 05, 09, 11, 14, 21, 24, 26, 29
Eurasian Curlew	<i>Numenius arquata</i>	IN-UP-01, 02, 03, 04, 05, 06, 07, 09, 10, 11, 12, 14, 17, 18, 21, 24, IN-DL-01
River Tern	<i>Sterna aurantia</i>	IN-UP-01, 02, 03, 04, 05, 06, 07, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 24, 25, IN-DL-01
River Lapwing	<i>Vanellus duvaucelli</i>	IN-UP-03, 04, 10, 11, 14, 21, 23, 26, IN-DL-01
Great Thick-knee	<i>Esacus recurvirostris</i>	IN-UP-02, 03, 04, 05, 09, 10, 11, 14, 21, 26
Black-tailed Godwit	<i>Limosa limosa</i>	IN-UP-03, 04, 05, 06, 07, 09, 11, 12, 14, 17, 18, 21, 23, 27, 30
European Roller	<i>Coracias garrulus</i>	IN-UP-03, 11, 24
Great Pied Hornbill	<i>Buceros bicornis</i>	IN-UP-02, 04, 05, 23, 24, 26, 29
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>	IN-UP-02, 03, 04, 05, 06, 29
Alexandrine Parakeet	<i>Psittacula eupatria</i>	IN-UP-02, 03, 04, 05, 06, 07, 09, 11, 12, 17, 18, 22, 23, 29

IN-DL-01: In the book *Important Bird Areas in India* (Islam & Rahmani 2004), Okhla Bird Sanctuary, Code IN-DL-01, was considered in the Delhi State. As half of Okhla Bird Sanctuary falls in UP, we are listing here the Threatened and Near Threatened birds found in this IBA also.

of 19 Endangered bird species of India, three are reported from Uttar Pradesh, of which Egyptian Vulture *Neophron percnopterus* has a good population in the state, while the other two, Lesser Florican *Sypheotides indica* and Baer's Pochard *Aythya baeri* have a few records. The Greater Adjutant *Leptoptilos dubius* has not been recorded during the last 30 years (Rahmani *et al.* 1990) but could occasionally

occur in eastern Uttar Pradesh.

Out of the 54 Vulnerable species in India, 12 are reported from Uttar Pradesh, and for the following eight species, this state is very important for survival: Swamp Francolin *Francolinus gularis*, Sarus Crane *Grus antigone*, Pallas's Fish-eagle *Haliaeetus leucoryphus*, Indian Skimmer *Rhynchos albicollis*, Great Slaty Woodpecker *Mulleripicus*



DHRITIMAN MUKHERJEE

National Chambal Sanctuary shares boundary with Madhya Pradesh, Uttar Pradesh and Rajasthan. It was declared mainly to protect Gharial *Gavialis gangeticus* and Gangetic Dolphin *Platanista gangetica* but the river and banks attract thousands of waterbirds. We have identified the Chambal River as IBAs in Uttar Pradesh and Madhya Pradesh



ASAD RAHMANI

Uttar Pradesh has fabulous wetlands such as Sandi, Lakh-Bahosi, Saman, Sheikha and Samaspur. All qualify IBA criteria

pulverulentus, Bristled Grassbird *Chaetornis striata*, White-throated or Hodgson's Bushchat *Saxicola insignis*, and Yellow Weaver *Ploceus megarhynchus*.

BirdLife International (2014) has listed 81 Near Threatened bird species in India, 21 of which occur in Uttar Pradesh. For two species, the Black-necked Stork *Ephippiorhynchus asiaticus* and the Rufous-rumped Grassbird *Graminicola bengalensis* wetlands and tall grasslands of Uttar Pradesh are very important for their survival. Earlier, Rahmani (1989), and recently Sundar and Kaur (2001) have shown that the wetlands of Uttar Pradesh are the major strongholds of the Black-necked Stork. It is found in 18-20 IBAs of Uttar Pradesh.

A species that needs special attention is the Hodgson's Bushchat *Saxicola insignis*. It is also known as the White-throated Bushchat or Hodgson's Stonechat. It has a highly localized breeding range in the mountains of Mongolia where it is difficult to study. Its winter range is the northern Gangetic plains and the *duars* of northern India, and the *terai* of Nepal and Uttar Pradesh. From the comparatively little information available, it is probably the scarcest species in its genus (Urquhart 2002). In northern India, it has been historically reported from Ambala in the west to northern Bengal in the east (Ali & Ripley 1987). It is found in heavy grassland, reeds, and tamarisk along riverbeds and cane fields. Earlier it was recorded in Kanpur, Gonda, Faizabad, Basti, and Gorakhpur (BirdLife International 2001, Urquhart 2002) but there are two records from Corbett Tiger Reserve. Bose *et al.* (1989) noted it during their birding in 1988-89, and Manoj Sharma (*pers. comm.* 2010) found it in Dhikala in the Corbett NP in February 2002. Corbett is now in Uttarakhand so technically there is no recent record from Uttar Pradesh. Javed & Rahmani (1998) did not record it in Dudhwa. However, due to the development of tall grasslands and marshes on seepages of the vast canal systems of the state, and extant tall grasslands along major rivers, this species is likely to be present in many areas. Considering

the paucity of reliable birdwatchers in Uttar Pradesh, it is most likely that the bird is found in many more areas than we know at present.

THREATENED BIRDS FOR WHICH UTTAR PRADESH IS IMPORTANT

Slender-billed Vulture *Gyps tenuirostris* Critically Endangered

This species is classified as Critically Endangered because it has suffered an extremely rapid population decline, particularly across the Indian subcontinent (BirdLife International 2001). This Vulture is found to the north of, and including, the Gangetic plain, in the west to at least Himachal Pradesh and Haryana and other parts. It has been reported from many places in the *terai*, particularly from Dudwa NP and Katarniaghat WLS.

Bengal Florican *Houbaropsis bengalensis* Endangered

The *terai* of Uttar Pradesh is a stronghold of this bird in India. It has been seen in the grasslands of Dudhwa, Katarniaghat, Kishanpur and Pilibhet, with occasional report in Lagga-Bagga Reserve Forest. BNHS has a major project to study its movement through satellite tracking. It spends nearly six months outside the protected areas in marginal crop fields.

Pallas's Fish-Eagle *Haliaeetus leucoryphus* Vulnerable

This species is inferred to have a small, declining population as a result of widespread loss, degradation and disturbance of wetlands and breeding sites throughout its range. It qualifies as Vulnerable (BirdLife International 2001). In India it was a widespread breeding species on lakes, and on large rivers in the north and northeast of the country



ASAD RAHMANI

Over-fishing is a bane of most wetlands of Uttar Pradesh. Sometimes, very small mesh-size is used that leaves not even fish eggs and fingerlings. Fishing is completely banned in most PAs/IBAs



Swamp Deer *Recurves duvaucelli* is the State Animal of Uttar Pradesh. It is found in Dudhwa NP, Kishanpur WLS, Pilibhit Tiger Reserve, Hastinapur WLS, and a small population in Katerniaghat WLS

but now everywhere uncommon. In Uttar Pradesh, it has definitely been reported in the Chambal Wildlife Sanctuary, Katerniaghat Wildlife Sanctuary and Tumeria Barrage.

Swamp Francolin *Francolinus gularis*

Vulnerable

Like the Bengal Florican, Uttar Pradesh is a stronghold in India of this Vulnerable species. Among the four members of the genus *Francolinus* in India, this species has the most restricted range, being confined to the tall, wet grasslands of the *terai* in Uttar Pradesh, Bihar, West Bengal, Assam, Meghalaya and Arunachal Pradesh (Javed *et al.* 1999, Javed 2000). From Uttar Pradesh, it is reported in Hastinapur WLS, Dudhwa NP, Kishanpur WLS, Katerniaghat WLS, Pilibhit TR and Lagga-Bagga RF and many grasslands outside protected areas.

Sarus Crane *Grus antigone*

Vulnerable

Sarus is the State Bird of Uttar Pradesh, and probably 20% of the world's Sarus population is found here. It is found all over the state in varying numbers, depending upon crop pattern, irrigation facilities and tolerance of local people. It is reported from many IBAs, namely Kishanpur WLS, Hastinapur WLS, Lakhbahosi Bird Sanctuary, Patna Bird Sanctuary, Nawabganj Bird Sanctuary, Samastipur Bird Sanctuary, Sheikha Jheel, Tikra Jheel and many other wetlands. The main strongholds in Uttar Pradesh are in Aligarh, Etah, Mainpuri and Etawah districts where almost

50-60% of UP's Sarus may be found.

Great Slaty Woodpecker *Mulleripicus pulverulentus* **Vulnerable**

This is one of the largest woodpeckers in the world. In Uttar Pradesh, it is mainly found in the mature Sal forests of Dudhwa NP, Katerniaghat WLS, Kishanpur WLS and Sohildev WLS. Sanjay Kumar (*pers. comm.* 2014) has seen in the Sal forest of Amangarh RF in Bijnor District in November 2013, and again in February 2014.

Bristled Grass-Warbler *Chaetornis striatus*

Vulnerable

This grassland specialist has a small, rapidly declining population owing to loss and degradation of its grassland habitat, primarily through drainage and conversion to agriculture (BirdLife International 2001). This vulnerable species is endemic to the Indian subcontinent. In Uttar Pradesh it has been recorded in the Dudhwa National Park and Okhla Wildlife Sanctuary. (Major part of Okhla Bird Sanctuary is in Uttar Pradesh, but part of it lies in Delhi).

Species such as Long-billed Vulture *Gyps indicus* (Critically Endangered), Red-headed Vulture *Sarcogyps calvus* (Critically Endangered), Egyptian Vulture *Neophron percnopterus* (Endangered), and Lesser Adjutant *Leptoptilos javanicus* (Vulnerable) also occur in Uttar Pradesh but they occur in other states/countries in much larger numbers so Uttar Pradesh is not their stronghold. Similarly, we are excluding Yellow Weaver *Ploceus*

IMPORTANT SARUS AREAS IN EASTERN UTTAR PRADESH

Sl. No.	District	Name of wetland	Area in hectare	Geographical Locations	Importance for Sarus
1	Maharajganj	Baisar Jheel	230	27°08.505' N 83°12.316' E	Congregation and nesting
2	Maharajganj	Kamnaha Jheel	210	26°06.749' N 87°11.975' E	Congregation and nesting
3	Maharajganj	Pragpur Jheel	100	27°19.851' N 83°44.071' E	Congregation and nesting
4	Maharajganj	Badauli Bankatti Jheel	110	26°18.300' N 83°45.048' E	Congregation and nesting
5	Faizabad	Bisauli Jheel	250	26°44.328' N 81°52.815' E	Roosting and foraging
6	Faizabad	Udhaila Jheel	75	26°36.001' N 81°53.754' E	Roosting and foraging
7	Faizabad	Sidsid Jheel	85	26°37.230' N 81°51.877' E	Congregation and nesting (?)
8	Pratapgarh	Daudpur Jheel	50	25°51.345' N 87°13.911' E	No use by Sarus
9	Pratapgarh	Bahuta Taal	30	25°53.057' N 82°13.348' E	Occasional use, nesting
10	Sultanpur	Enjar Taal	118	26°29.526' N 81°57.229' E	Congregation site
11	Basti	Merdhani Taal	10	26°46.929' N 82°37.843' E	Congregation site
12	Basti	Chando Taal	650	26°43.331' N 82°39.769' E	Congregation site
13	Sant Kabir Nagar	Bakhira Jheel	2900	26°55.678' N 83°07.324' E	Congregation and nesting
14	Sant Kabir Nagar	Belduha Taal	110	26°38.143' N 83°07.812' E	Congregation and nesting
15	Siddhartha Nagar	Semra Taal	108	27°25.763' N 82°58.215' E	Congregation and nesting
16	Siddhartha Nagar	Masai Sagar Jheel	42	27°25.332' N 83°01.199' E	Congregation and nesting
17	Deoria	Sonda Taal	26	26°28.233' N 83°47.723' E	Congregation and nesting
18	Bahraich	Chittaura Jheel	1039	27°32.574' N 81°38.628' E	Congregation and nesting
19	Shrawasti	Sacraail Taal	90	27°33.622' N 81°48.243' E	Congregation and nesting
20	Shahjahanpur	Raipur Jhabar Jheel	100	27°44.984' N 80°00.421' E	Congregation site
21	Shahjahanpur	Faqurganj Jheel	199	27°48.571' N 80°01.716' E	Congregation site
22	Pilibhit	Maini Jhabar Jheel	49	28°16.982' N 79°52.251' E	Congregation and nesting
23	Lakhimpur-Kheri	Semrai Taal	150	28°01.826' N 80°30.957' E	Congregation and nesting
24	Sitapur	Taalgaon Taal	90	27°37.103' N 80°51.408' E	Congregation site
25	Barabanki	Nardahi Taal	35	26°36.552' N 81°12.381' E	Roosting and nesting
26	Kushinagar	Berhara Taal	15	26°53.717' N 83°39.251' E	Congregation and nesting
27	Kushinagar	Pachar Taal	2500	26°53.678' N 83°40.902' E	Congregation and nesting

(Source: Wildlife Trust of India (2015) Important Sarus Wetland Sites in the Agricultural Landscape of Eastern Uttar Pradesh. Wildlife Trust of India, New Delhi, pp. 61.)

megarhynchus (Vulnerable) as there is no authentic recent record from the State.

THREATS AND CONSERVATION ISSUES

Uttar Pradesh is one of the most densely populated states in India with less than 7% area under forest cover. As mentioned earlier, the Gangetic plains have practically no forest cover left. The marshes and wetlands of the Gangetic drainage system show a long history of stability in geological sense, thus many species are found in these marshland/wetland/grassland complexes, such as Striated Marsh Warbler or Grassbird *Megalurus palustris*, Bristled Grassbird *Chaetornis striata*, Indian Grassbird or Rufous-rumped Grassbird *Graminicola bengalensis*, Yellow-bellied

Prinia Prinia flaviventris, Swamp Francolin *Francolinus gularis*, Bengal Florican *Houbaropsis bengalensis*, and various ducks. Unfortunately, one of the duck species, the Pink-headed Duck *Rhodonessa caryophyllacea*, has become extinct, not due to any geological upheaval but due to human-related activities.

Twenty-one out of 31 IBAs of Uttar Pradesh qualify on the basis of A4iii criteria (site known to hold, on regular basis, more than 20,000 waterfowl each year). Conservation potential of these wetlands is tremendous as shown by studies of Kumar and Srivastava (2011) in Sitapur district along. Sustainable use of these wetlands benefits local people and biodiversity (Howes 1995). They also help in water and climate security of India. However, many of these wetlands



Swamp Francolin



Yellow Weaver



Rufous-rumped Grassbird

Tall wet grasslands of the terai harbour some of the most important grassland-dependent bird species of India

are under tremendous pressure from fishing, overgrazing, cultivation, drainage, and pollution. Sometimes ill-conceived government plans are major threats to these wetlands, as is the case with the extremely important Sarus habitat in the Mainpuri-Etawah region. Another issue of concern is the large scale diversion of wetlands and other waterbodies for Water Chestnut (*singhara*) cultivation after getting the *patta* (official permission) for fishing. The use of pesticides to increase productivity has adversely impacted the habitat of Sarus Crane and waterfowl.

The forests and grasslands of Dudhwa, Kishanpur, Katarniaghat, Suhelwa and Sohagi Barwa remain strong and vital reservoirs of *terai* biodiversity, and are important social and economic assets (Kumar *et al.* 2002). These PAs/IBAs are well-protected. However, the effect of annual grass burning and spread of invasive species such as *Tiliacora acuminata* are not fully known. Changes in river hydrology, associated siltation, and excessive ground water exploitation are causing changes in forest and grassland composition and structure (Kumar *et al.* 2002). Encroachment of forest land is still a major issue and vital corridors are still being lost (e.g., Dudhwa and Katarniaghat, Garha corridor between Mala and Deoria range of Pilibhit R.F. and Dudhwa and Kishanpur). Livestock grazing is a major problem, especially in sanctuaries.

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BAKHIRA WILDLIFE SANCTUARY

IBA Site Code : IN-UP-01

State : Uttar Pradesh

District : Sant Kabir Nagar

Coordinates : 26° 34' 60" N,
83° 00' 00" E

Ownership : State

Area : 2,894 ha

Altitude : Not available

Rainfall : 800–1,000 mm

Temperature : 4 °C to 48 °C

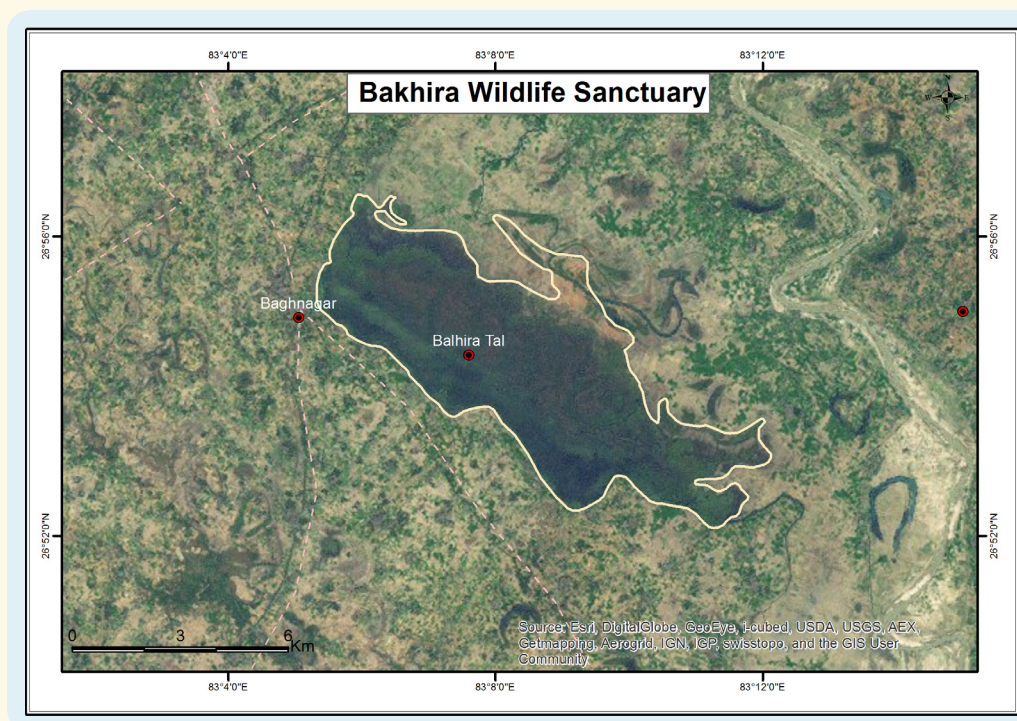
Biogeographic Zone : Gangetic Plain

Habitats : Freshwater Swamp

IN-UP-01

IBA CRITERIA: A1 (Threatened species), A4iii ($\geq 20,000$ waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in May 1990.



GENERAL DESCRIPTION

Bakhira Wildlife Sanctuary came into existence in 1990. This sanctuary is situated in Sant Kabir Nagar district, which was carved out of district Basti. The total area of the sanctuary is 2,894 ha, of which 1,819 ha is *gram samaj* (revenue) land, 1,059 ha is agricultural land and 15 ha is Reserve Forest area. The *gram samaj* land forms the core zone of the sanctuary, which contains the main waterbody Bakhira Taal. This is one of the important wetlands of eastern Uttar Pradesh and provides wintering and staging grounds for a large number of migratory birds, and breeding ground for resident birds, such as Purple Swampphen *Porphyrio porphyrio*.

Bakhira was selected as an IBA on the basis of A4iii criteria, but now it seems that the bird population has declined drastically, mainly due to intensive fishing and poisoning.

Based on earlier records, Islam & Rahmani (2008) proposed Bakhira wetlands as a potential Ramsar Site as

it used to qualify for Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies), but considering the present condition of the wetland, it will not fit any Ramsar criteria. It is therefore necessary for the state Forest Department to take all necessary steps to restore the wetland to its former glory.

AVIFAUNA

Between 40,000 to 80,000 waterbirds used to visit this wetland during winter, the prominent species being Red-crested Pochard *Netta rufina*, Northern Pintail *Anas acuta*, and Northern Shoveller *Anas clypeata*. However, a recent survey in mid November 2014 shows that the bird population has drastically declined, and whatever numbers

of migratory birds may come, they would not stay for long due to disturbances from intensive fishing day and night.

However, recent surveys conducted by BNHS along with the Bakhira Range forest staff show that not less than 150 Sarus Crane *Grus antigone* are found in and around Bakhira. There has been no decline for the last 15 years, when K.S.G. Sundar (*pers. comm.* 2003) had counted 100–150 Sarus in the early 2000s.

According to Tripathy (2002), 23 species of waterfowl are found in this wetland, including more than 5,000 Purple Swamphen (Moorhen) *Porphyrio porphyrio*. This is a common and widespread species, but there are not many sites in India where such a large breeding population is found. The increasing biotic pressures have resulted in the decline of most bird species.

Detailed research on avifauna has not been conducted, so we do not have a complete bird checklist. Once we have results from a good study, the Threatened species (A1) list is likely to increase.

VULNERABLE

Sarus Crane

Grus antigone

OTHER KEY FAUNA

As Bakhira Sanctuary is surrounded by human habitation, there is no large wild mammal in the area. Smaller mammals seen are Golden Jackal *Canis aureus*, Jungle Cat *Felis chaus*, and Small Indian Mongoose *Herpestes javanicus*. Not much is known about the reptiles, amphibians, and fish of this sanctuary.

LAND USE

- Agriculture
- Nature conservation
- Tourism

THREATS AND CONSERVATION ISSUES

- Drainage
- Grazing
- Poaching
- Illegal fishing
- Use of pesticides in surrounding fields

At least 24 villages surround the sanctuary, hence anthropogenic pressure on the area is extremely heavy. In order to facilitate fishing, villagers regularly remove aquatic vegetation including *Phragmites karka* which is good for resident breeding birds. A management plan for the sanctuary should be quickly prepared by technical experts who can look into all aspects, including control on fishing and maintenance of natural vegetation. Regular bird census to monitor the populations of various species should be conducted by the Forest Department and by experienced ornithologists. Its vicinity to Gorakhpur (less than 50 km), a fast developing city, could bring Bakhira on the tourist map of Uttar Pradesh.

Encroachment on the sanctuary by agricultural landowners has not been brought under control by the Forest Department. Illegal fishing and shooting of birds also takes place.

Fishing is very intensive in Bakhira. At least 6,000 boats operate, but disturbance to other aquatic fauna including birds and over-exploitation of fish are restricted due to the continuous vigilance by the Forest Department (Tripathy 2002).

According to Abrar Ahmed of TRAFFIC-India (*pers. comm.* 2013) Bakhira wetland used to be a waterbird trapping ground, a practice now curbed by the vigilant Forest Department. Nevertheless, recent evidence points to the extensive use of chemical poisoning (e.g. from carbofuran, trade name Furadan) to kill birds for local consumption.

KEY CONTRIBUTORS

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DUDHWA NATIONAL PARK

IBA Site Code : IN-UP-02

State : Uttar Pradesh

District : Lakhimpur-Kheri

Coordinates : 28° 29' 27" N, 80° 42' 08" E

Ownership : State

Area : 49,000 ha

Altitude : 150–184 msl

Rainfall : 1,750 mm

Temperature : 4 °C to 40 °C

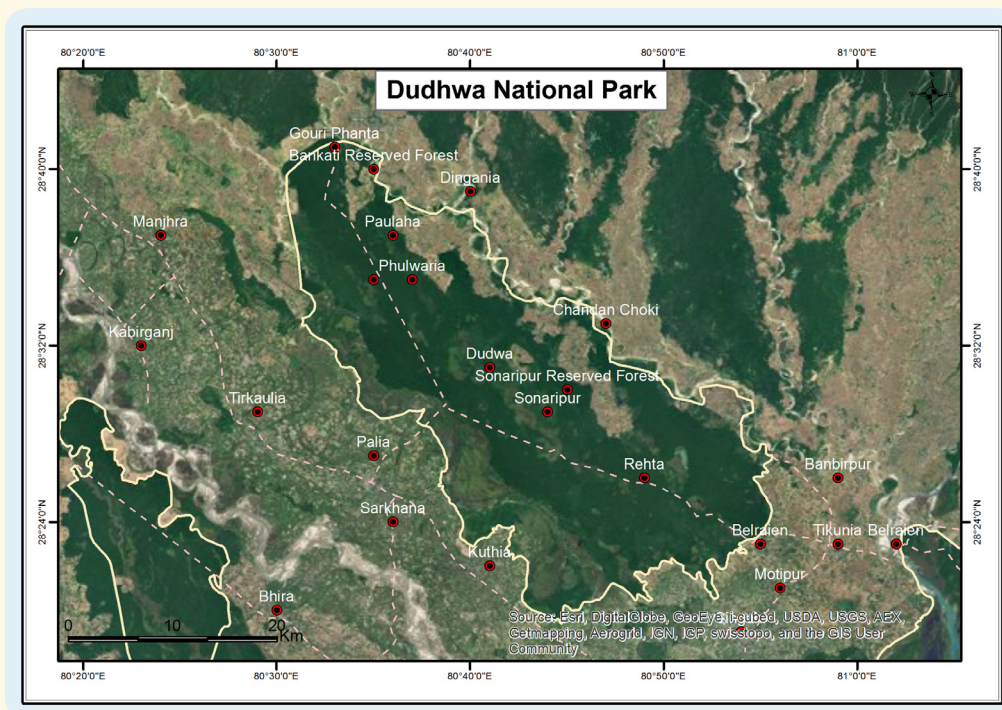
Biogeographic Zone : Gangetic Plain

Habitats : Moist Deciduous Forest, Dry
Deciduous Forest, Tropical Grassland

IN-UP-02

IBA CRITERIA: A1 (Threatened species), A3 (Biome 12: Indo-Gangetic Plains)

PROTECTION STATUS: National Park, established on February 2, 1977.



GENERAL DESCRIPTION

With the aim of protecting the relict population of Swamp Deer *Cervus duvauceli duvauceli*, an area of 212 sq. km of Lakhimpur-Kheri forests was declared as Dudhwa Sanctuary. In 1977, the area was declared as a National Park with a core zone of 490 sq. km and a buffer zone of 124 sq. km. In 1987, the Park was brought under Project Tiger with the addition of 201 sq. km of Kishanpur Wildlife Sanctuary. In the early half of 2000, Katarniaghat Wildlife Sanctuary (400 sq. km) was included in Dudhwa National Park. Dudhwa and Kishanpur are not contiguous, and the River Sharda forms a natural barrier. The buffer zone in Dudhwa National Park (DNP) is located to the north of the core zone and still includes Tharu tribal villages. Most of the requirements of the Tharus are met by the buffer zone. About 30,000 people continue to live in an area c. 5 sq. km in and around the national park. They are partly dependent on the forest for

thatching, fodder, and fuelwood, and create an important management issue. The Suheli barrage adjoining Bilrayan Range of the park holds a good population of migratory waterbirds in winter. This is partly owned by the Forest Department and partly by the Irrigation Department.

Dudhwa NP falls under *Terai-Bhabar* biogeographic subdivision of the Upper Gangetic Plains (7A) according to the biogeographic classification of Rodgers & Panwar (1988).

Considering the role of its *terai* wetlands in conserving threatened ecological communities, Islam & Rahmani (2008) proposed Dudhwa NP as a Ramsar site as it qualifies for Ramsar Criteria 2.

AVIFAUNA

Dudhwa National Park is rich in avifauna. Three hundred and thirty species of birds were recorded during three years

of intensive studies at this site (Javed & Rahmani 1998). The site falls in Biome 12, but species of Biomes 5, 7, 8, and 11 are also reported from the site. The biome species are enlisted in the given table along with threatened species.

Of the 330 species, 112 are resident breeding birds, including important ones such as the Critically Endangered Bengal Florican *Houbaropsis bengalensis* and Vulnerable Swamp Francolin *Francolinus gularis*. Another 31 are resident, but breeding in Dudhwa has not been confirmed. Winter migrants constitute at least 90 of the total number of species. The majority of these are waterfowl, and there are also several species of leaf warblers *Phylloscopus* spp. (Javed & Rahmani 1998).

Among the habitat types, wetlands/marshland have the highest number of species (105). These two habitats also account for the highest number of Threatened species (15–16% of the birds recorded in Dudhwa). The Sal forest has 53 bird species, and does not include any globally Threatened species; however, the Pompadour Green Pigeon *Treron pompadora* was seen, and constituted the first record from Uttar Pradesh.

Of the 330 bird species recorded in Dudhwa (Javed & Rahmani 1998), 29 are globally Threatened or Near Threatened. Earlier, Dudhwa used to have significant populations of White-rumped *Gyps bengalensis* and Slender-billed *Gyps tenuirostris* Vultures, but now they are rarely seen. Similarly, Red-headed Vulture *Aegypius calvus* has also declined drastically, and during the last ten years, there are only two or three records.

The Lesser Florican *Sypheotides indicus* is infrequently seen. Lesser Adjutant *Leptoptilos javanicus* is another regular breeder in the park in small numbers, probably not more than 10 pairs. Pallas's Fish-eagle *Haliaeetus leucoryphus* is irregularly seen. There is an old record of Wood Snipe *Gallinago nemoricola* from the district (BirdLife International 2001).

The Spot-billed Pelican *Pelecanus philippensis* and Marbled Duck *Marmaronetta angustirostris* occur in Dudhwa in small numbers. At least four pairs of Near Threatened Black-necked Stork *Ephippiorhynchus asiaticus* are found here, and a few sub-adults are also seen in and just outside the park.

The Bengal Florican is one of the flagship species of Dudhwa. Fortunately, since 1985 when long-term monitoring was started, its population has not decreased. Most of the territories located in the late 1980s are still occupied. In a survey conducted in 2001, at least 24 territorial males were seen in Dudhwa Tiger Reserve (which included Kishanpur Wildlife Sanctuary, an IBA). Assuming that the sex ratio is equal, about 60 adult birds are found in Dudhwa (Rahmani 2001).

Based on biological, socio-economic, cultural, and social values, administrative importance, geographical and habitat representations, Rahmani & Islam (2000) have prioritized

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>

ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
Lesser Florican	<i>Sypheotides indicus</i>

VULNERABLE

Spot-billed Pelican	<i>Pelecanus philippensis</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Woolly-necked Stork	<i>Ciconia episcopus</i>
Marbled Teal	<i>Marmaronetta angustirostris</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Greater Spotted-eagle	<i>Clanga clanga</i>
Swamp Francolin	<i>Francolinus gularis</i>
Sarus Crane	<i>Grus antigone</i>
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>
Wood Snipe (old record)	<i>Gallinago nemoricola</i>
Grey-breasted Prinia	<i>Prinia cinereocapilla</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Falcated Duck	<i>Anas falcata</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Tern	<i>Sterna aurantia</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>

BIOME 12: INDO-GANGETIC PLAINS

Swamp Francolin	<i>Francolinus gularis</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
White-tailed Stonechat	<i>Saxicola leucura</i>
Striated Babbler	<i>Turdoides earlei</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>
Black-breasted Weaver	<i>Ploceus bengalensis</i>

the grasslands of Dudhwa as Priority No. 1. According to Rahmani (1996), c. 70 bird species are found in these floodplain grasslands, of which 22 species or subspecies are exclusively found here. Birds of the *terai* region show high



DHIRTIMAN MUKHERJEE

Bengal Florican is an iconic species of the grasslands of Dudhwa NP. It has been sighted in 24 grasslands ten years ago but latest figures are not available

dependency on the grasslands to complete their life cycle: 46 out of 70 species use these grasslands for foraging and breeding, while 23 use them for foraging only. Ten species are threatened with extinction, mainly due to the destruction of these grasslands.

BirdLife International (undated) has identified 13 species of Biome 12 (Indo-Gangetic Plains), of which six have been seen in Dudhwa grasslands, which again proves the importance of this IBA for the protection of grassland birds and other animals.

OTHER KEY FAUNA

Dudhwa National Park is extremely rich in fauna. Thirty-one species of large mammals have been reported, including Tiger *Panthera tigris* and five species of deer (Swamp Deer *Cervus duvauceli*, Sambar *C. unicolor*, Chital *Axis axis*, Hog Deer *Axis porcinus*, and Barking Deer *Muntiacus muntjak*). The *terai* grasslands have some vital endangered species of India such as Swamp Deer, Hispid Hare *Caprolagus hispidus* and Indian One-horned Rhinoceros *Rhinoceros unicornis*. Other important mammals include Asian Elephant *Elephas maximus*, Sloth Bear *Melursus ursinus*, Ratel *Mellivora capensis*, Large Indian Civet *Viverra zibetha*, Golden Jackal *Canis aureus*, Fishing Cat *Prionailurus viverrinus*, Jungle Cat *Felis chaus*, and Leopard *Panthera pardus*. Crocodile *Crocodylus palustris*, Common Otter *Lutra lutra*, and Bengal

Monitor Lizard *Varanus bengalensis* can be observed near the river banks.

Asian Elephant was not seen for two decades after establishing the national park, but by the mid 1990s, they became frequent and now a small herd of 10–15 is almost resident. The introduced Rhino has now increased to 33. There is a plan to bring in a new blood line of Rhino from Assam and West Bengal.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Poaching
- Forest fires
- Fuelwood collection

Before the declaration of this area as a national park, there used to be large human settlements inside the forest, mostly in the grassland area. These settlements, known as *ghauri*, were used for grazing cattle. Extensive grazing by cattle and harvesting of grasses maintained these grasslands. The areas around these settlements were maintained as sward, and provided wild ungulates with soft, palatable, and nutritious grasses. After the declaration of Dudhwa National Park, cattle grazing and



ASAD R. RAHMANI

Dudhwa NP has one of the finest Sal *Shorea robusta* forests left in India.
A total of 330 species of birds has been identified till now

other human activities were checked. This, together with annual grass burning at the beginning of the dry season, has led to changes in the structure and composition of the grasslands and a marked reduction in ungulate population. Annual burning is practiced to check the growth of herbs and woody species. Burning has two effects in the Park. In some situations, it is a useful exercise, whereas in other cases it is detrimental, as it alters the habitat to the extent that it becomes less attractive to many threatened species. In order to strike a balance, a proper regime is essential, so that certain areas are burnt and other areas left unburnt. This mosaic of burnt and unburnt, tall and short grass patches will provide the optimal habitat for most of the key grassland animal and bird species.

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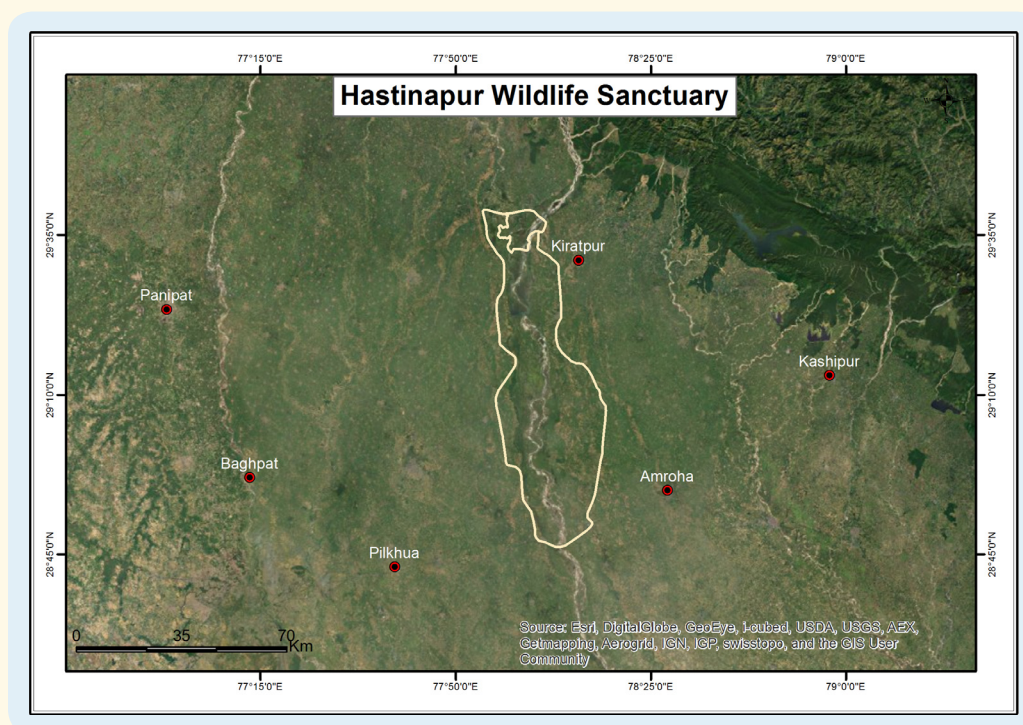
HASTINAPUR WILDLIFE SANCTUARY

IBA Code	: IN-UP-03	Ownership	: State
State	: Uttar Pradesh	Altitude	: 100–120 msl
Districts	: Bijnor, Hapur, Muzaffarnagar, Jyotiba Phule Nagar (Amroha), Meerut	Rainfall	: 800–1,000 mm
Coordinates	: 29° 32' 28" N, 78° 08' 47" E	Temperature	: 5 °C to 43 °C
Area	: 207,300 ha (actual area under Forest Department control 22,194 ha)	Biogeographic Zone	: Gangetic Plain
		Habitats	: Tropical Dry Deciduous Forest, Tropical Secondary Scrub, Tropical Grassland, Wetland

IN-UP-03

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Wildlife Sanctuary, established in July 1986.



GENERAL DESCRIPTION

Hastinapur Wildlife Sanctuary lies along the banks of the Ganga in western Uttar Pradesh. The sanctuary was established mainly to accord protection to Swamp Deer *Cervus duvauceli duvauceli*, the state animal of Uttar Pradesh, and to conserve a fast vanishing, unique biome, known as Gangetic *Khadar*. It is unique in that it contains a variety of landforms and habitat types such as wetland, marshes, dry sandbeds and gently sloping ravines known as *Khola*. Before the 1980s, the Gangetic *Khadar* had extensive tracts of tall wet and dry grass, and *Khola* had luxuriant forests. However, today (late 2000s) much of the natural vegetation has been lost due to industries, human settlements, and extensive cultivation. Thus, the sanctuary

is under great biotic pressure. Earlier, a large number of wild animals from the sanctuary used to get electrocuted by the live electric fences that farmers had erected around their fields to save their crops. As a result, once abundant populations of mammalian species such as the Swamp Deer and Hog Deer *Axis porcinus* have become severely fragmented and several other species such as the Grey Wolf *Canis lupus* and Striped Hyaena *Hyaena hyaena* have almost disappeared. However, the population of Leopard *Panthera pardus* has increased.

The vegetation of the sanctuary can be classified into tall wet grasslands, dry short grasslands, scrub, and plantations (Nawab 2000). Considering the importance of its *terai* wetlands conserving threatened ecological communities,

Islam & Rahmani (2008) have suggested that Hastinapur wetlands qualify for Ramsar Criteria 2.

AVIFAUNA

Rai (1983) had listed 257 species but Bhargava (2012) has listed 288, including eight previously unreported from Meerut, hence the total now is 296. Large congregations of waterbirds can be seen during winter. Sarus Crane *Grus antigone* can be seen regularly (A. Khan, *pers. comm.* 2002). Indian Skimmer *Rynchops albicollis* is seen in winter. According to Rajat Bhargava who has visited this area many times, it is a very good breeding ground for the Near Threatened River Lapwing *Vanellus duvaucelii*.

According to Bhargava (2012), three Critically Endangered, three Endangered, and nine Vulnerable bird species are found in and around the sanctuary. In addition, 15 Near Threatened species have also been recorded.

Rai (1979) reported 28 individuals of globally Threatened Yellow Weaver or Finn's Baya *Ploceus megarhynchus* from this site in June 1979, but none were located in July 1998 (Bhargava 2000) or subsequently (R. Bhargava, *pers. comm.* 2002, 2014). Similarly, there are unconfirmed reports of Swamp Francolin *Francolinus gularis* (Salim Javed, *pers. comm.* 2001). The habitat is still suitable for both these species. Recent surveys by Rajat Bhargava and Satish Jain in 2013–2014 show that the chances of the presence of Swamp Francolin *Francolinus gularis* and Yellow Weaver *Ploceus megarhynchus* are remote.

OTHER KEY FAUNA

The mammalian fauna of the sanctuary includes the famous Swamp Deer *Cervus duvaucelii duvaucelii*, for which it was established. Its habitat is shared by Hog Deer *Axis porcinus*. In the drier parts of the sanctuary,



A total of 288 bird species has been identified in Hastinapur Wildlife Sanctuary. There are unconfirmed reports of Swamp Francolin *Francolinus gularis*

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Saker Falcon	<i>Falco cherrug</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Swamp Francolin(?)	<i>Francolinus gularis</i>
Sarus Crane	<i>Grus antigone</i>
Indian Skimmer	<i>Rynchops albicollis</i>
Yellow-eyed Pigeon	<i>Columba eversmanni</i>
Bristled Grassbird	<i>Chaetornis striatus</i>
Finn's Baya(?)	<i>Ploceus megarhynchus</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Tern	<i>Sterna aurantia</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
European Roller	<i>Coracias garrulus</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>

and in agricultural areas, Nilgai or Bluebull *Boselaphus tragocamelus* is present, sometimes in large herds. Along with the Wild Boar *Sus scrofa*, it is the main agricultural pest. Blackbuck *Antelope cervicapra* used to be present in large numbers but now it is locally extinct. Golden Jackal *Canis aureus*, Jungle Cat *Felis chaus*, and Fishing Cat *Prionailurus viverrinus* are also reported, but being nocturnal they are rarely seen. The River Ganga, around which this sanctuary has been established, still harbours the highly endangered Gangetic Dolphin *Platanista gangetica*.

The Uttar Pradesh Forest Department, along with WWF-India, has released the Critically Endangered Gharial *Gavialis gangeticus* from time to time during the last 10 years in the Ganga river. Its population is being monitored by a team from WWF-India.

LAND USE

- Nature conservation and research
- Agriculture



BHASMANG MEHTA

Near Threatened River Lapwing *Vanellus duvaucelii* is commonly found in the Ganga river that passes through the Sanctuary

THREATS AND CONSERVATION ISSUES

- Disturbance to birds
- Intensive cultivation of riversides and sand flats
- Grass extraction
- Habitat alteration
- Grazing

The sanctuary is subjected to great anthropogenic pressures, mainly due to large-scale commercial exploitation of grasses *Phragmites* spp., grazing, and illegal cultivation (Khan 1995, 1996). Many swamp areas have been drained and converted into crop fields. Heavy grazing on islands during summer is a threat to island breeders. Electrocution of wild animals on fences put up for the protection of crops is common at several places.

The importance of Hastinapur Wildlife Sanctuary needs to be highlighted. At present, it is known for its religious and historical significance, mainly in and around the famous Hastinapur town.

Commercial exploitation of grass is now much curtailed, however, villagers still use the grass for domestic purposes. Grass use for thatching as also decreased.

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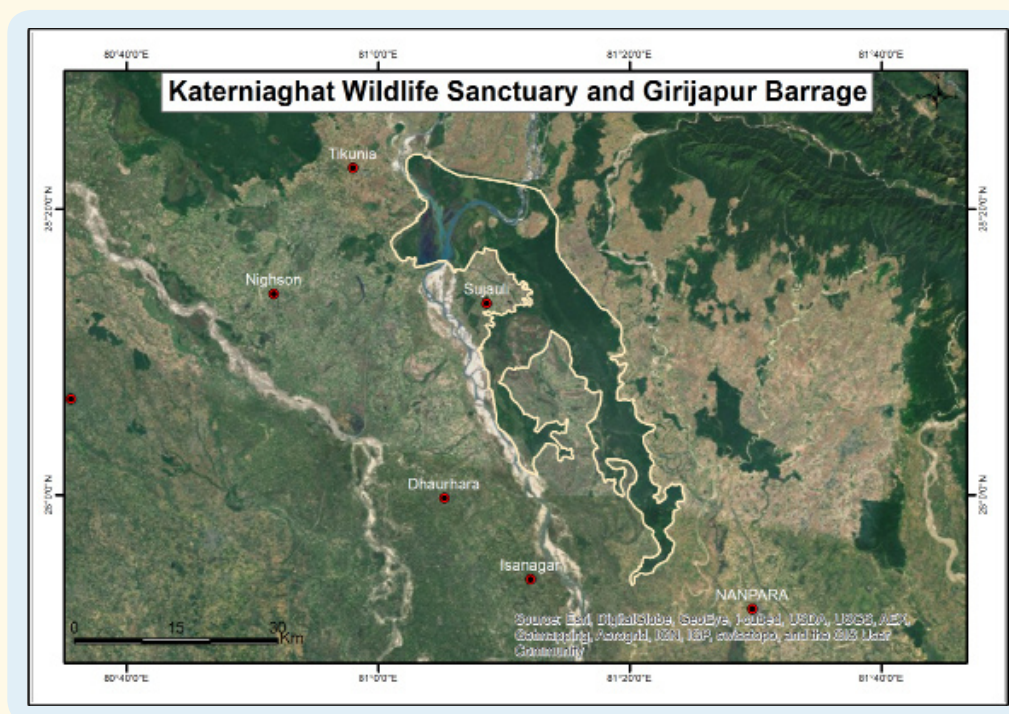
KATERNIAGHAT WILDLIFE SANCTUARY AND GIRIJAPURI RESERVOIR

IN-UP-04

IBA Site Code	: IN-UP-04	Altitude	: 170–190 msl
State	: Uttar Pradesh	Rainfall	: 1,000–1,600 mm
District	: Bahraich	Temperature	: 4 °C to 40 °C
Coordinates	: 28° 14' 40" N, 81° 11' 29" E	Biogeographic Zone	: Gangetic Plain
Ownership	: State	Habitats	: Tropical Moist Deciduous Forest, Riverine Vegetation, Freshwater Swamp
Area	: 40,069 ha		

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Wildlife Sanctuary, established May, 1976.



GENERAL DESCRIPTION

Katerniaghat Wildlife Sanctuary is situated in northeastern Uttar Pradesh, bordering the international boundary with Nepal, in the Bahraich Division, and covers an area of about 40,069 ha. It supports diverse vegetation and this accounts for its high faunal diversity. It is the only protected area in Uttar Pradesh with a population of wild, free ranging Rhinos *Rhinoceros unicornis* (while in the nearby Dudhwa NP, also an IBA, they have been reintroduced). These rhinos have come from Nepal and now some of them are resident. In 2007, six rhinos were reported from Katerniaghat that had come from Royal Bardia Wildlife Sanctuary in Nepal (Sinha 2007).

Katerniaghat WLS is part of the *terai* landscape and has a weak link with Dudhwa National Park on the western side, Bardia National Park (Nepal) on the northern side

and Chakia Range of Bahraich Forest Division to the east. Given the highly threatened status of the *terai* ecosystem, it is very important that top priority is given to strengthening these corridors (Chanchani *et al.* 2014). The sanctuary has reserve forest areas contiguous with its the southern side. According to the Management Plan, the entire sanctuary has been termed as the core area. However, the thoroughfare provided by the road and the railway line that pass through the heart of the sanctuary is leading to high level of disturbance. The Girijapuri Reservoir holds considerable numbers of wintering waterfowl. Islam & Rahmani (2008) have suggested that wetlands in Katerniaghat qualify for Ramsar Criteria 2 (wetlands conserving threatened ecological communities) and Criteria 5 (wetland regularly supports 20,000 or more waterbirds). Girwa river runs through the sanctuary.

The vegetation of Katerniaghat is very similar to Dudhwa National Park, although much fragmented. It has moist Bhabar and dry plain forest of *Shorea robusta*, eastern seasonal swamp forest, low alluvial savanna woodland, Aegle forest, and Khair-Sissoo forest. *Syzygium* and *Trewia nudiflora* dominate the riparian forest. There are extensive areas under seasonal floods, dominated by tall wet grasslands of *Phragmites karka* and *Arundo donax*. Such areas remain under water for three to five months. The upland grasslands, which do not get flooded, are dominated by *Saccharum munja*, *Imperata cylindrica*, and *Desmostachya bipinnata*.

Nearly 40 years ago, most of the dry grasslands were planted with *Tectona grandis*, *Dalbergia sissoo*, *Bombax ceiba*, and *Eucalyptus* by the Forest Department. These plantations are now ripe for harvesting of timber and restoration of natural grasslands.

AVIFAUNA

More than 280 species are reported from the sanctuary (Rahmani 1995, unpubl.). The Girijapuri Reservoir, with its large waterspread, attracts thousands of waterfowl, whose number would easily exceed 20,000. Perhaps the best-known wintering population of Great Crested Grebe *Podiceps cristatus* in Uttar Pradesh occurs in Girijapuri Reservoir. Between 80–120 could be seen in the reservoir itself. Other prominent waterfowl in the reservoir include Brahminy Duck *Tadorna ferruginea*, Red-crested Pochard *Rhodonessa rufina*, and Lesser Whistling-duck *Dendrocygna javanica*.

In 2000–2001, the Critically Endangered White-rumped Vulture *Gyps bengalensis* was found nesting along the Girwa river, mainly on *Terminalia tomentosa* and *Bombax malabarica* trees, but subsequently, many nests had dead birds, victims of diclofenac, a veterinary drug. Slender-billed Vulture *Gyps tenuirostris*, along with White-rumped, Griffon *Gyps fulvus*, and Himalayan Griffon *Gyps himalayensis* are sometimes seen on cattle carcasses or roosting on river islands. Occasionally, Red-headed Vulture *Aegypius calvus* is also seen, either solitarily or in twos or threes.

The grasslands of Katerniaghat WLS had Bengal Florican till the 1970s (Arjan Singh, pers. comm. 2000) but none were seen by Rahmani *et al.* (1991) during surveys between 1985 and 1991, or subsequently. However, in March 2001, B.C. Choudhury (pers. comm. 2002) of the Wildlife Institute of India, Dehradun saw two male floricans. Later, in May, during another survey, no Bengal Florican could be located (Rahmani 2001). Nevertheless, Katerniaghat remains a potential habitat for this Endangered species.

A nest of Pallas's Fish-eagle *Haliaeetus leucoryphus* near Girija Barrage was in use for many years and seen till 2002, but was not seen in subsequent years. Either the species has stopped nesting in the sanctuary or now nests in some other areas.

The Vulnerable Swamp Francolin *Francolinus gularis* is mainly seen in the wet grasslands of the Girijapuri Reservoir.

Islands in the Girwa river are important nesting grounds for River Tern *Sterna aurantia* and Small Pratincole *Glareola lactea*.

BirdLife International (undated) has identified 13 species of Biome 12 (Indo-Gangetic Plains), of which five have been seen in Katerniaghat till now. The grasslands of Katerniaghat have been given Priority I for conservation (Rahmani & Islam 2000).

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Bengal Florican (stray records)	<i>Houbaropsis bengalensis</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Asian Woolly-necked	<i>Ciconia episcopus</i>
Pallas's Fish-Eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted-eagle	<i>Aquila clanga</i>
Swamp Francolin	<i>Francolinus gularis</i>
Sarus Crane	<i>Grus antigone</i>
Great Slaty Woodpecker (?)	<i>Mulleripicus pulverulentus</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Falcated Duck	<i>Anas falcata</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Tern	<i>Sterna aurantia</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>

BIOME 12: INDO-GANGETIC PLAINS

Swamp Francolin	<i>Francolinus gularis</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
White-tailed Stonechat	<i>Saxicola leucura</i>
Striated Babbler	<i>Turdoides earlei</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>
Black-breasted Weaver	<i>Ploceus bengalensis</i>

OTHER KEY FAUNA

Katerniaghat WLS was established to protect and rehabilitate the Gharial *Gavialis gangeticus* and Marsh Crocodile *Crocodylus palustris*. For more than 25 years, it had a crocodile breeding centre, which has been dismantled now due to successful rehabilitation of crocodiles (D. Basu, pers. comm. 2002). Katerniaghat has been listed as a Priority I grassland considering the conservation requirements of the following Endangered species: Tiger *Panthera tigris*, Leopard *P. pardus*, Sloth bear *Melursus ursinus*, Swamp Deer *Cervus duvauceli duvauceli*, Hog Deer *Cervus porcinus*, and Swamp Francolin and other grassland birds (Rahmani & Islam 2000). The One-horned Rhinoceros has dispersed from the Royal Bardia National Park of Nepal to Katerniaghat. Katernia has all the species found in Dudhwa NP such as five species of deer, and the Smooth-coated Otter *Lutrogale perspicillata*.

Das *et al.* (2012) conducted a short survey on herpetofauna of Katerniaghat WLS and recorded 42 species of reptiles belonging to 14 families and 32 genera, and 10 species of amphibians belonging to four families and eight genera. The sanctuary is also exceptionally diverse in turtle fauna. As many as 13 species are recorded. *Chitra indica* is an Endangered species. Also the riverine stretch comes under natural distribution of *Batagur kachuga*, a Critically Endangered species

Some of the species worth mentioning are Banded Krait *Bungarus fasciatus*, Burmese Rock Python *Python molurus*

bivittatus, and Yellow-speckled Wolf-snake *Lycodon jara*. Red Coral or Kukri Snake *Oligodon kheriensis* was described from North Kheri Division in 1936 and it was rediscovered by Fazlur Rahman of Katerniaghat Foundation, a local NGO, in 2012. Subsequently, this poorly known species was recorded from northern West Bengal and Mahendranagar, Nepal. Therefore, its sighting in Katerniaghat is interesting and further proves that detailed biodiversity studies are required in this IBA.

LAND USE

- Nature conservation and research
- Forestry
- Human habitation

THREATS AND CONSERVATION ISSUES

- Human settlements
- Poaching
- Forest fire
- Afforestation
- Livestock grazing (almost 40,000 cattle)

There are around 100 villages dependent on the resources of the sanctuary, particularly for grazing, with almost 40,000 cattle grazing within the sanctuary. Rahmani & Islam (2000) have mentioned that grazing, forest fires, and afforestation are the primary threats to these Priority 1 *terai* grasslands. Poaching of wild animals, particularly from the Nepal side, requires strategic planning to deal with the problem.



ASAD R. RAHMANI

Despite the fact that Katerniaghat faces numerous challenges due to intense biotic pressure on its wavy borders, it still has some undisturbed old growth forest where even Great Pied Hornbill *Buceros bicornis* is still seen



White-rumped Vulture *Gyps bengalensis* and Slender-billed Vulture *G. tenuirostris* still breed in Katarniaghat, albeit in very small numbers. The Terai Arc, of which Katarniaghat is a part, is selected for future release of captive-bred vultures, so Vulture Safe Zone is being developed by BNHS and RSPB in collaboration with the Forest Department

ASAD R. RAHMANI

About 3,000 ha area under the Seed Farm of the State Agriculture Department has been transferred to the Forest Department. It should be developed as grassland habitat for the Bengal Florican and no plantation should be done.

Despite coming under Dudhwa Tiger Reserve, Katarniaghat Wildlife Sanctuary is facing acute problems of manpower. About 55 km border of the division touches Nepal, from where most of the poaching is carried out. There are about 65 villages on the border and outside the sanctuary, which are densely populated and create huge biological pressure on the forests.

Girijapuri Barrage is an important conservation issue, at least in case of some large reptilian species such as turtles and Gharial. Abhijit Das (reptile expert of the Wildlife Institute of India, *pers. comm.* 2014), presumes that dispersal of Gharial and large turtles is hindered by the barrage.

Among the incidents of man-animal conflict, which are happening in Uttar Pradesh, Katarniaghat Wildlife Sanctuary tops the rank. The number of tourists is also going up considerably, for which special skills are required to manage them. The poor resources of the division and the scarcity of frontline staff are making it difficult to safeguard the forest and the wildlife. Following the inclusion of the land of a central seed farm in the division, the local farmers regularly try to infiltrate into the area and the lack of staff is making it even more difficult to protect it. Many approved staff posts are not filled despite repeated reminders by the sanctuary managers. The Katarniaghat Forests provide strategic connectivity between the tiger habitats of Dudhwa and Kishanpur in India and the Bardia National Park in Nepal.

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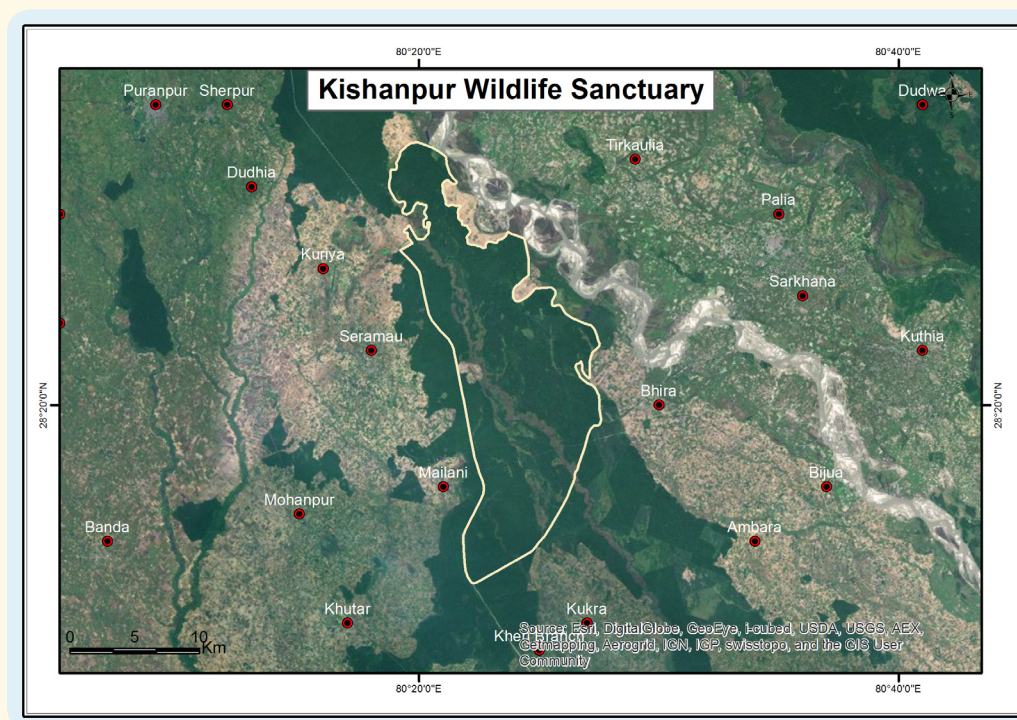
KISHANPUR WILDLIFE SANCTUARY

IN-UP-05

IBA Site Code	: IN-UP-05	Altitude	: 200 msl
State	: Uttar Pradesh	Rainfall	: 1,750 mm
District	: Lakhimpur Kheri	Temperature	: 4 °C to 40 °C
Coordinates	: 28° 23' 47" N, 80° 21' 52" E	Biogeographic Zone	: Gangetic Plain
Ownership	: State	Habitats	: Tropical Moist Deciduous Forest, Tropical Grassland, Freshwater Swamp
Area	: 22,700 ha		

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Wildlife Sanctuary, established in October 1972.



GENERAL DESCRIPTION

Kishanpur Wildlife Sanctuary was declared on January 1, 1973, and in 1988 it came under Project Tiger. The sanctuary has four ranges: Bhira, Kishanpur, Mailani, and Pawayari. Along with Dudhwa and Katarniaghat (both IBAs), Kishanpur has one of the most important *terai* grasslands remaining in northern India. Before the Tiger *Panthera tigris* was declared a protected species, Kishanpur had some of the most coveted tiger shooting blocks in India. As the forest was managed for timber logging, plantation, and shooting, Kishanpur has a good road network. Most of the grasslands have been planted over by the Forest Department with *Shorea robusta*, *Tectona grandis*, *Syzygium cumini*, *Madhuca indica*, *Bombax ceiba*, *Acacia catechuoides*, and *Eucalyptus*. However, some low-lying grasslands (e.g., Jhadi Taal) remain, which are extremely important for the Vulnerable Swamp Deer *Rucervus duvauceli* and Critically

Endangered Bengal Florican *Houbaropsis bengalensis*.

The open grasslands are called locally *chander* or *phanta*. Most of them are present in the depressions representing the dry beds of old rivers (probably the Sharda). The orientation of these grasslands is the same as the slopes of the tract, i.e., northwest to southeast and to the south. Based on cultural and social values, administrative importance, geographical and habitat representations, Rahmani & Islam (2000) have prioritized the grasslands of Kishanpur as Priority No. I.

AVIFAUNA

Kishanpur WLS has habitats similar to Dudhwa NP, and is a part of Dudhwa Tiger Reserve, so it has similar bird species, although detailed studies like in Dudhwa (e.g., Javed & Rahmani 1998) have not been done. Moreover, it is not visited by many ornithologists so the updating of the bird checklist is not as good for Dudhwa NP. However,

based on many visits by Rahmani during the last 30 years, more than 250 species of birds are recorded in Kishanpur WLS, including the Critically Endangered Bengal Florican (Rahmani 1996, 2001).

Jhadi Taal is an important site for wintering waterfowl, including the Vulnerable Lesser Adjutant *Leptoptilos javanicus* and Sarus Crane *Grus antigone*, and the Near Threatened Black-necked Stork *Ephippiorhynchus asiaticus*. It attracts up to 5,000 waterfowl, including flocks of 300–500 Lesser Whistling Duck *Dendrocygna javanicus*, Greylag Goose *Anser anser*, and assorted ducks. A pair of Black-necked Stork with two to three juveniles has been seen on every visit in 1990s (A.R. Rahmani, *unpubl.*). During summer, 10–12 Black-necked Stork, adults and juveniles, were seen in Jhadi Taal (Rahmani 2012).

During monsoon, the whole Jhadi Taal is inundated, but the water recedes by October. From March onwards, two territorial male Bengal Floricans are sometimes seen. One or two are spotted in Burgad Chowki grasslands (Rahmani 1996, 2001). There could be more Bengal Florican in this IBA. A more detailed survey of all the grasslands is required.

OTHER KEY FAUNA

Perhaps the largest single population of Swamp Deer *Cervus duvauceli* in Uttar Pradesh is found in Jhadi Taal. They total about 400 individuals. Smaller scattered groups are also found in other grasslands, but their number would not exceed 50–60. Other species of note are Tiger *Panthera tigris*, Hog Deer *Axis porcinus*, Cheetal *Axis axis*, Sambar *Cervus unicolor*, and Wild Boar *Sus scrofa*. No information is available on the reptiles, amphibians, and fish. An occasional Rhino *Rhinoceros unicornis* is found from time to time. The sanctuary is a perfect place to reintroduce this species.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Firewood collection
- Livestock grazing
- NTFP collection
- Poaching

As Kishanpur WLS has numerous roads and canals, and is located near a growing town called Mailani, biotic disturbance is great. Earlier, poaching was a big problem but since the inclusion of Kishanpur in Dudhwa Tiger Reserve, patrolling has increased so the situation is not so bad anymore. However, cattle grazing in some parts is still a problem, especially in the grasslands of Burgad Chowki, where the Bengal Florican is found.

During summer, controlling forest fires becomes the major activity of the forest staff. These fires are generally

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>

ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
Lesser Florican	<i>Sypheotides indicus</i>

VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Swamp Francolin	<i>Francolinus gularis</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Falcated Duck	<i>Anas falcata</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Gret-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Tern	<i>Sterna aurantia</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>

BIOME 12: INDO-GANGETIC PLAINS

Swamp Francolin	<i>Francolinus gularis</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
White-tailed Stonechat	<i>Saxicola leucura</i>
Striated Babbler	<i>Turdoides earlei</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>
Black-breasted Weaver	<i>Ploceus bengalensis</i>

lit by casually thrown cigarettes or are deliberately lit by villagers. The Forest Department also burns the grasslands for management purposes. The impact of long-term, repeated burning needs to be studied.

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SANJAY PATHAK

Kishanpur Wildlife Sanctuary is small but an important part of Terai Arc Landscape. Perhaps the largest single herd of Swamp Deer *Cervus duvaucelii* is found in Jhadi Taal of Kishanpur. More than 250 species of birds have been identified from this IBA, including 12 that are in Red List of IUCN.

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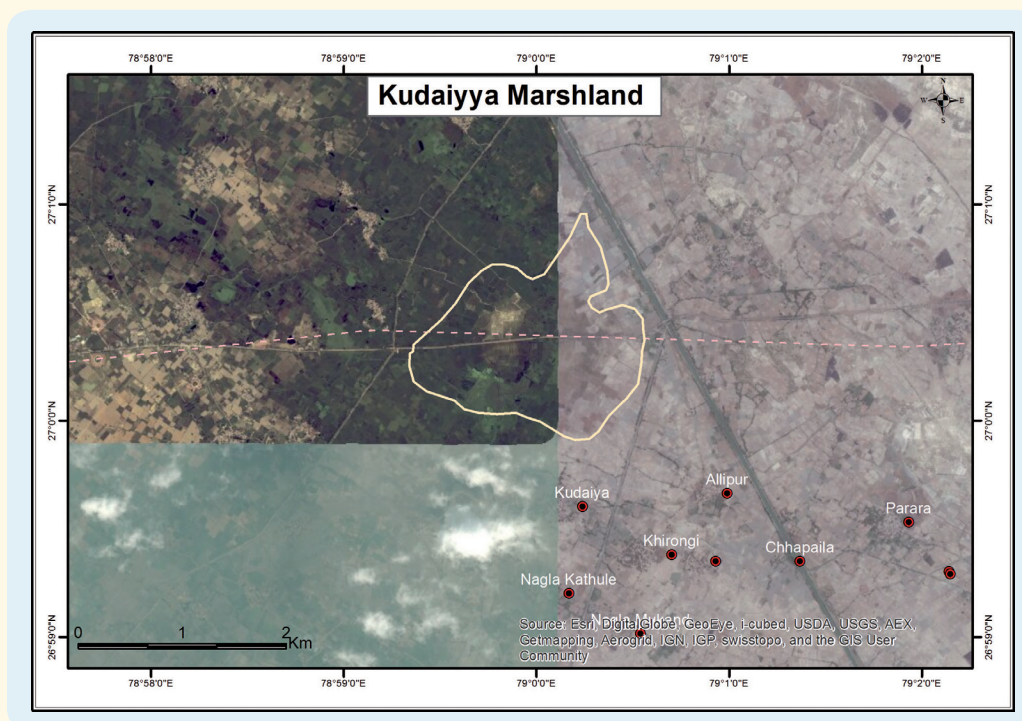
KUDAIYYA MARSHLAND

IBA Site Code	: IN-UP-06	Area	: 300 ha
State	: Uttar Pradesh	Altitude	: 140 msl
District	: Mainpuri	Rainfall	: 880 mm
Coordinates	: 26° 59' 36" N, 78° 59' 25" E	Temperature	: 1 °C to 50 °C
Ownership	: State, Village, Private	Biogeographic Zone	: Gangetic Plain
		Habitats	: Seasonal Marsh, Freshwater Swamp

IN-UP-06

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation $\geq 20,000$ waterbirds)

PROTECTION STATUS: Not officially protected. IBA in Danger.



GENERAL DESCRIPTION

Kudaiyya marshland is situated along the Karhal-Kishni highway in Mainpuri district, c. 8 km from Karhal town. It is also approachable from Saiphai town to its west, via a smaller road. The marsh is situated just beside Kudaiyya village from which it is named. It is formed by the flooding of a natural depression. The most prominent feature of the marsh is the abundant growth of *Typha* that is clearly distinguishable even from a distance. Less than half of the water surface is open, but many areas are hidden from view by tall reeds. The appearance of this wetland changes dramatically in the monsoon, as it is filled with pink lotus flowers blooming in profusion. The principal source of water to the marsh is rain. However, it is connected to a tributary of the right-wing Ganga canal, and frequently gets water through this source throughout the year. Even when it is

completely full during the monsoon, water depth in the wetland does not exceed 1.5 m in the deepest parts. For the most part, it is less than 0.5 m, and the marsh dries up in the peak summer month of June, before it is filled up by rain water again in July.

The marsh is overgrown with lilies, lotus, many sedges, grasses, and aquatic plants, all of which give the impression that the water is choked with vegetation.

The single reason why this site is important is its function as a stop-over point for thousands of ducks, waders, and pelicans, both at the beginning and the end of the winter. More than 45 species recuperate at the lake for two to three days before moving on. During the rest of the winter, a few hundred ducks stay back. The marsh is also the roosting area of a resident flock of more than 200 Sarus Crane *Grus antigone*. In summer, this marsh is the

only source of water for the farmers of the surrounding paddyfields.

During the monsoon and immediately afterwards, the lake supports impressive congregations of the Lesser Whistling Duck *Dendrocygna javanica*, Purple Moorhen or Swampen *Porphyrio porphyrio*, and Pheasant-tailed Jacana *Hydrophasianus chirurgus*.

Based on earlier information, Islam & Rahmani (2008) found that Kudaiyya marshland qualifies for two criteria of the Ramsar Convention: Criteria 2 (wetland supports threatened ecological communities), and Criteria 5 (wetland regularly supports 20,000 or more waterbirds). As the marsh has now deteriorated due to biotic pressures, it may not be able to fulfill these criteria, but with proper management, it can be restored to its past ecological status.

AVIFAUNA

Birds are clearly the most important and conspicuous taxa that justify the conservation of this wetland. Between late October and early November, many flocks of wintering waterbirds stop over at Kudaiyya before continuing their southbound journey. Counts of ducks during the years 2000 and 2001 ranged from 45,000–65,000. The principal duck species were Northern Pintail *Anas acuta*, Common Teal *A. crecca*, Wigeon *A. penelope*, some Eurasian Coot *Fulica atra* and Red-crested Pochard *Netta rufina*. The most common wader species that uses this wetland as a stopover site is the Black-tailed Godwit *Limosa limosa*: one flock in the year 2000 numbered 4,000 (Gopi Sundar, *pers. comm.* 2003). The largest recorded flock of the Great White Pelican *Pelecanus onocrotalus* in this marsh numbered 300 individuals in the winter of 2001. More than 150 species of birds have been sighted in and along the wetland, and include bitterns, crakes, moorhens, lapwings, spoonbills, and wagtails (Gopi Sundar, *pers. comm.* 2003).

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
----------------------	-------------------------

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
------------------	------------------------------

VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>

Apart from the congregation of 200 Sarus (Sundar 2001), the wetland is home to a minimum of eight breeding pairs of this species, most of which were able to raise at least one chick a year during 1999–2002, and at least 13 young Sarus dispersed from these territories in the same period (Gopi Sundar, *pers. comm.* 2003). Colour banding of Sarus Crane chicks living in the area indicated that the territory sizes of these pairs were much smaller than the average for the region, indicating better territory quality at Kudaiyya.

One breeding pair of Black-necked Stork *Ephippiorhynchus asiaticus* uses this marsh as part of its territory, and has been seen to breed successfully in 1999 and 2001. The largest count of the Lesser Whistling Duck in the wetland was 15,000 in October, 2000.

Unfortunately, during the last ten years, Kudaiyya marshland has deteriorated. During surveys for a project on bird flu surveillance, the BNHS team found it extremely poor in terms of anatids. Spot-billed Duck *Anas poecilorhyncha* and Northern Pintail were found only once in January 2009 and February 2010, respectively. Other anatids were recorded in small numbers. Villagers frequently move around in the area in winter to collect lotus tubers and grass. The marshland has been drained by farmers. Nevertheless, Sarus Crane and Black-necked Stork were regularly recorded in the wetland. The maximum population of waterbirds was 346 individuals in this wetland in the winter of 2008–2009, whereas it was 516 individuals in the winter of 2009–2010. The maximum and minimum population counts of waterbirds in summer 2009 were 234 and 14 individuals respectively (Rahmani *et al.* (2010).

OTHER KEY FAUNA

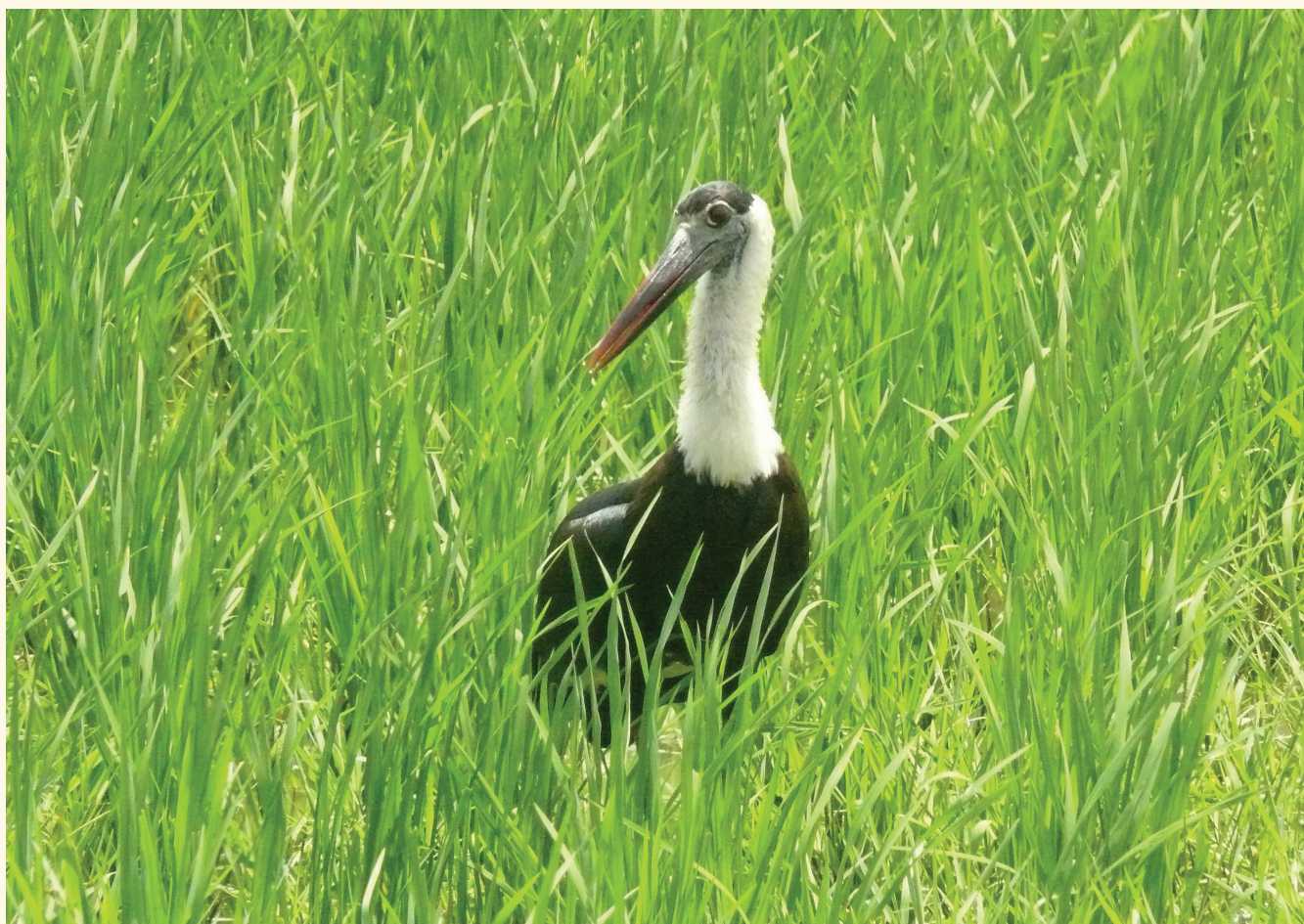
Other fauna that inhabit the wetland include a very healthy population of the Soft-shelled Turtle *Lissemys punctata* and a few Pond Terrapin *Geoclemys hamiltonii*. Signs of Common Otter *Lutra lutra* can be observed around the wetland, but they are decidedly rare. A thriving population of Jungle Cat *Felis chaus* lives among the reeds throughout the year.

LAND USE

- Agriculture
- Irrigation

THREATS AND CONSERVATION ISSUES

- Poaching
- Cultivation of Water Chestnut
- Drainage of water for cultivation (irregular irrigation practices)
- Agricultural expansion on the lake edges
- Conversion of common land (public property) to private holdings
- Eutrophication



ASAD R. RAHMANI

A few years ago, more than 20,000 waterfowl were estimated in Kudaiyya wetlands, hence its inclusion as an IBA. We do not have the latest information. Nonetheless, significant numbers of Sarus Crane and Asian Woollyneck (above) are found in this large wetland

Waterfowl are hunted regularly during the winter, but not for commercial purposes. With increased awareness among the villagers in recent years, this practice is severely discouraged. The marsh is hedged by crop fields on all sides, and agricultural expansion is the most serious threat to the waterbody. The *panchayat* (village council) has the power to regulate human activities in the area, and so far has succeeded in maintaining the area as common grazing grounds for cattle, and for collection of lotus. Increased inflow of water due to unplanned work by the State Irrigation Department and other departments is responsible for aggravating public opinion against maintenance of the wetland, and pressure to completely drain it is growing increasingly. However, the biggest and long-term threat is the wetlands drainage project funded by the World Bank. Construction of a culvert at Kudaiyya resulted in the decline of the resident Sarus population from over 200 to just 22 (Gopi Sundar 2001).

KEY CONTRIBUTOR

K.S. Gopi Sundar

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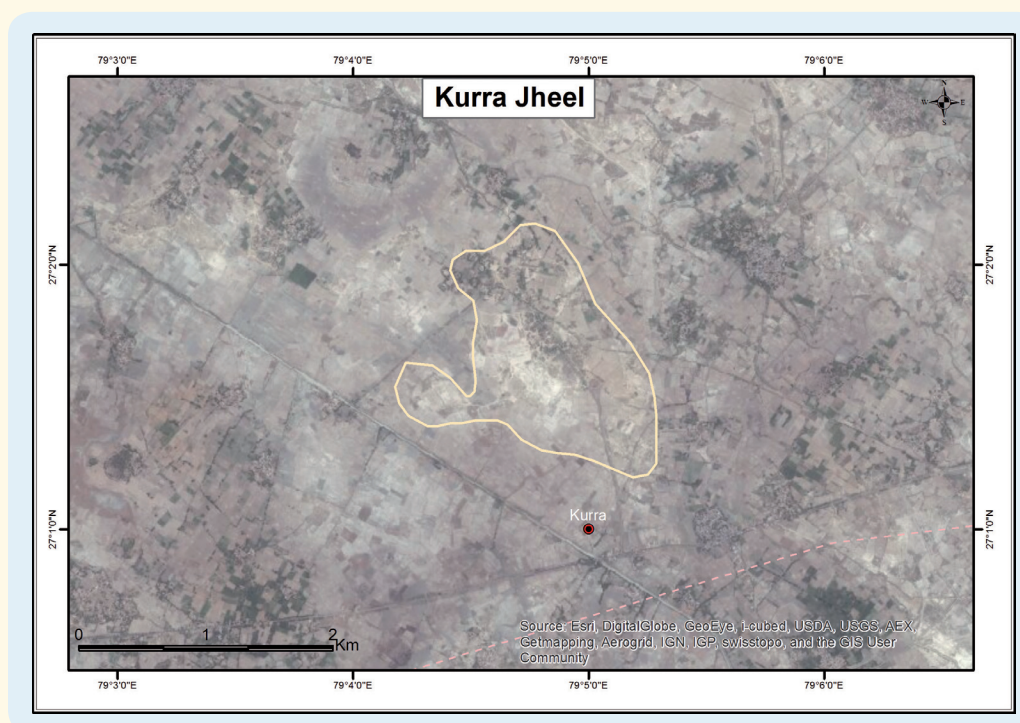
KURRA JHEEL

IN-UP-07

IBA Site Code	: IN-UP-07	Area	: 200 ha
State	: Uttar Pradesh	Altitude	: 160-170 msl
Districts	: Etawah, Mainpuri	Rainfall	: 880 mm
Coordinates	: 27° 01' 00" N, 79° 05' 60" E	Temperature	: 4 °C to 40 °C
Ownership	: Private	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation ≥20,000 waterbirds)

PROTECTION STATUS: Not officially protected. IBA in Danger.



GENERAL DESCRIPTION

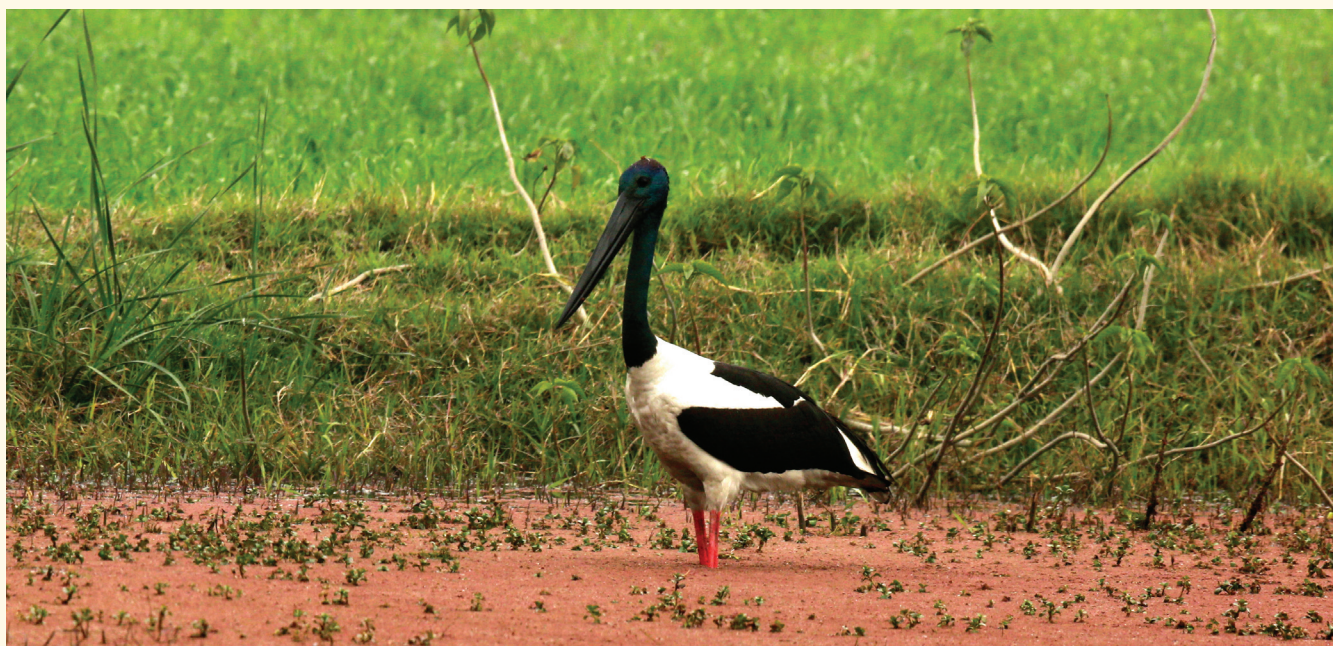
Kurra Jheel is near Hajipura village in Kurra, Mainpuri district. There are several small, medium, and large wetlands, interspersed with agricultural fields, providing an ideal habitat for Sarus Crane *Grus antigone*. The jheel lies in close proximity to human habitation and is flanked by a bifurcated road. At least 400 Sarus, including 17–25 breeding pairs, are found here in summer (April-May).

Based on earlier information, Islam & Rahmani (2008) found that Kurra Jheel fulfills the following criteria of Ramsar Convention: Criteria 2 (wetland supports threatened ecological communities), and Criteria 5 (wetland regularly supports 20,000 or more waterbirds). As the wetland has deteriorated due to biotic pressures, it may not be able to fulfill Ramsar criteria, but with proper management, its ecological status can be restored.

AVIFAUNA

Kurra wetland attracts large numbers of migratory birds in winter, and also has resident bird fauna. The site is particularly important for its large Sarus Crane *Grus antigone* population (K.S. Gopi Sundar, *pers. comm.* 2003). Besides Sarus, other Threatened birds recorded from this site are Sociable Lapwing *Vanellus gregarius* and Greater Spotted Eagle *Clanga clanga*. Yellow Weaver *Ploceus megarhynchus* may be present (K.S. Gopi Sundar, *pers. comm.* 2003).

The site was known for large congregations of more than 20,000 waterbirds in winter, but during the last 10 years, the condition of the jheel has deteriorated due to encroachment. In a survey in 2008–2009, for an Avian Flu Surveillance project, the BNHS team recorded 38 species of waterbirds at Kurra Jheel Among waterfowl, Lesser Whistling Duck *Dendrocygna javanica*, Gadwall *Anas strepera*, Northern



SANJAY KUMAR

The condition of Kurra Jheel has deteriorated during the last 10 years due to intensive biotic pressures on resources and encroachment, therefore, we consider it IBA in Danger. Black-necked Stork *Ephippiorhynchus asiaticus* is still found and breeds in the area.

CRITICALLY ENDANGERED

Sociable Lapwing (occasional) *Vanellus gregarius*

VULNERABLE

Greater Spotted Eagle *Clanga clanga*
Sarus Crane *Grus antigone*
Yellow Weaver (?) *Ploceus megarhynchus*

NEAR THREATENED

Oriental Darter *Anhinga melanogaster*
Painted Stork *Mycteria leucocephala*
Black-necked Stork *Ephippiorhynchus asiaticus*
Black-headed Ibis *Threskiornis melanocephalus*
Ferruginous Duck *Aythya nyroca*
Eurasian Curlew *Numenius arquata*
Black-tailed Godwit *Limosa limosa*
Alexandrine Parakeet *Psittacula eupatria*

Shoveller *A. clypeata*, and Common Teal *A. crecca* were seen in extremely low numbers in this wetland. Although the jheel has the potential to harbour more waterfowl, as seen 10 years ago, the abundance of waterbirds was very low during our study period due to low precipitation and increased disturbance. In the winter of 2008–2009, a maximum of 458 individuals of waterbirds was recorded here. During summer 2009, we recorded a maximum of 224 individuals and a minimum of 88, in April and May respectively. The summer count mainly included cormorants, egrets, herons, storks, and Sarus. In winter 2009–2010, a maximum of 333 and a minimum of 187 individuals of waterbirds was recorded here. Sarus Crane and Black-necked Stork were recorded throughout the year in the jheel (Rahmani *et al* 2010).

OTHER KEY FAUNA

The site was selected on the basis of a large number of waterfowl and congregation of Sarus Crane. However,

it is not of particular conservation concern for terrestrial fauna.

LAND USE

- Agriculture
- Fisheries
- Water management

THREATS AND CONSERVATION ISSUES

- Poaching
- Drainage of water

Since it is an officially non-protected site, owned by local people and partly under the revenue department, Kurra wetland is locally protected but there are reports of bird poaching. The wetland is being used for agriculture after draining out the water. Local people also catch fish from the wetland. The fauna and flora, and the conservation issues affecting this site, need to be documented.

KEY CONTRIBUTOR

K.S. Gopi Sundar

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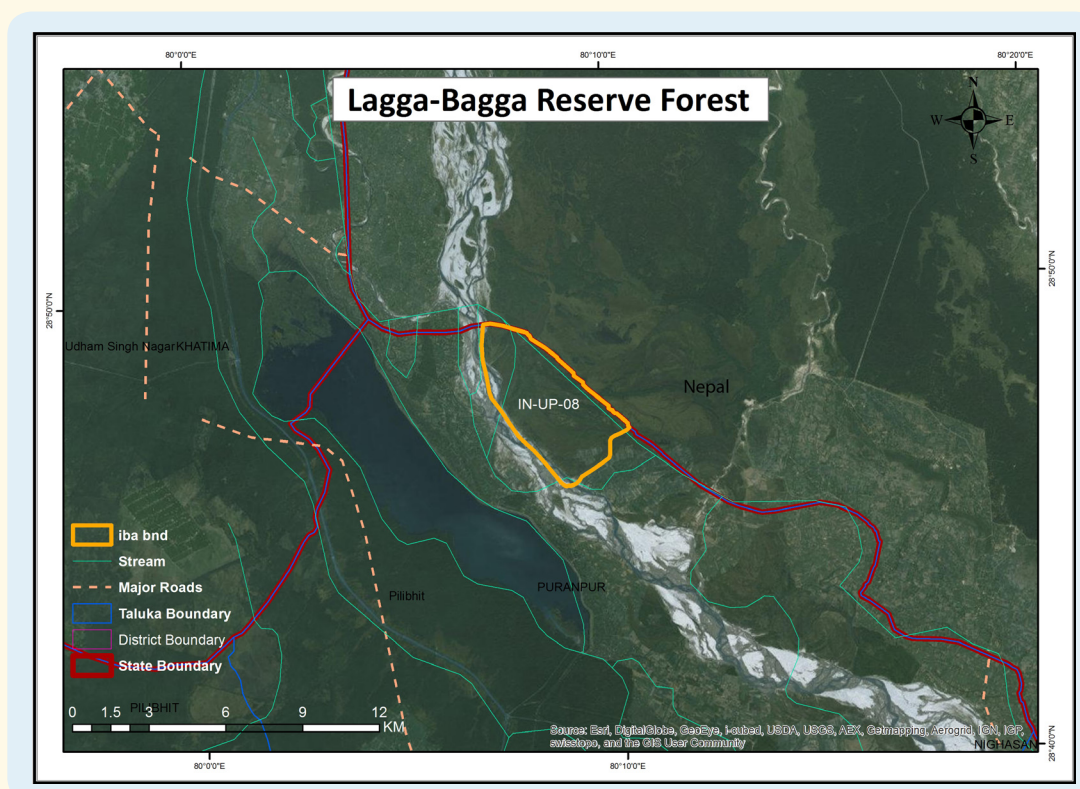
LAGGA-BAGGA RESERVE FOREST

IN-UP-08

IBA Site Code	: IN-UP-08	Altitude	: Not available
State	: Uttar Pradesh	Rainfall	: 1,750 mm
District	: Pilibhit	Temperature	: 4 °C to 45 °C
Coordinates	: 28° 37' 00" N, 79° 47' 60" E	Biogeographic Zone	: Gangetic Plain
Ownership	: State	Habitats	: Tropical Grassland, Tropical Dry Deciduous and Tropical Moist Deciduous Forest
Area	: 1,160 ha		

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Not officially protected. Data Deficient.



GENERAL DESCRIPTION

Lagga-Bagga is located on the Indo-Nepal border, adjoining the famous Sukla Phanta Wildlife Sanctuary of Nepal on the northeast side. To the south and southeast, Sharda river flows in a loop around it. The forest and grasslands of Lagga-Bagga form a continuous stretch with Sukla Phanta, except for a small trench demarcating the international border. Sukla Phanta has a good population of Bengal Florican *Houbaropsis bengalensis* (Inskipp and Inskipp 1985). It also holds very good populations of Swamp Deer *Cervus duvauceli*, Hog Deer *Axis porcinus*, Spotted Deer *Axis axis* and Tiger *Panthera tigris*. There is regular movement of large mammals between Lagga-Bagga and Sukla-Phanta (Rahmani, *et al.* 1987, Rahmani 1989).

Rahmani and Islam (2000) analysed Indian grasslands and prioritized them on the basis of biological, socio-economic, cultural and social values, administrative importance, geographical and habitat representations. The grasslands of Lagga-Bagga were given Priority No. II. Priority No. I grasslands belong to Dudhwa, Katarniaghat and Kishanpur (all IBAs). Like in Dudhwa, the grassland of Lagga-Bagga is dominated by *Saccharum*, *Themeda* and *Apluda mutica*.

AVIFAUNA

Being a sort of corridor between Sukla Phanta and North Pilibhit forests, Lagga-Bagga, although it is only 11 sq km, is extremely important. It has three main grasslands or

ENDANGERED

Bengal Florican (occasional) *Houbaropsis bengalensis*

VULNERABLE

Swamp Francolin *Francolinus gularis*
Sarus Crane *Grus antigone*

chanders which harbour Swamp Francolin *Francolinus gularis*. Between 1985 and 1991, three surveys were conducted to search the Bengal Florican (Rahmani *et al.* 1987,) but none could be located. However, in April 2002, Prakash Rao (*pers. comm.* 2002) saw an adult male, thus proving a long-held view that Lagga-Bagga is a potential habitat for this endangered species. More regular and detailed surveys are required to find out whether the florican permanently occupies this site. More recently, a brief survey was conducted in May 2012, but Bengal was not seen. The main grasslands has been planted over the by the Forest Department or trees have spread naturally.

We consider Lagga-Bagga as Data Deficient as far as bird fauna is concerned. Thorough surveys covering all seasons of the year are required. Its proximity to Sukla Phanta grassland makes Lagga-Bagga as a potential habitat for many grassland species.

OTHER KEY FAUNA

There is regular movement of large mammals such as Swamp Deer *Cervus duvauceli*, Hog Deer *Axis percinus*, Spotted Deer or Cheetal *Axis axis* and Tiger *Panthera tigris*. Pellets similar to those of Hispid Hare *Caprolagus hispidus* were seen during 1991 (A. R. Rahmani, unpublished).

LAND USE

- Forestry

THREATS AND CONSERVATION ISSUES

- Grazing
- Firewood collection
- Poaching across Nepal border
- Forest fire

As Lagga-Bagga remains flooded for many months, permanent agriculture is not possible, but the threat of encroachment, backed by political support, is always present. The State Forest Department had planted exotic trees in all the grasslands, but fortunately many have died out (due to flooding). Lagga-Bagga, as a corridor, would play a crucial role in the movement of animals between North Pilibhit and Sukla Phanta of Nepal. Lagga-Bagga is now a part of Pilibhet Tiger Reserve.

A chowki of Sema Suraksha Bal (Border Security Force) has been established inside Lagga-Bagga who have a positive and negative influence. Their presence has increase human pressure on the habitat but at the same time, their presence has prevented large-scale poaching of large animals.

KEY CONTRIBUTOR

Asad R. Rahmani

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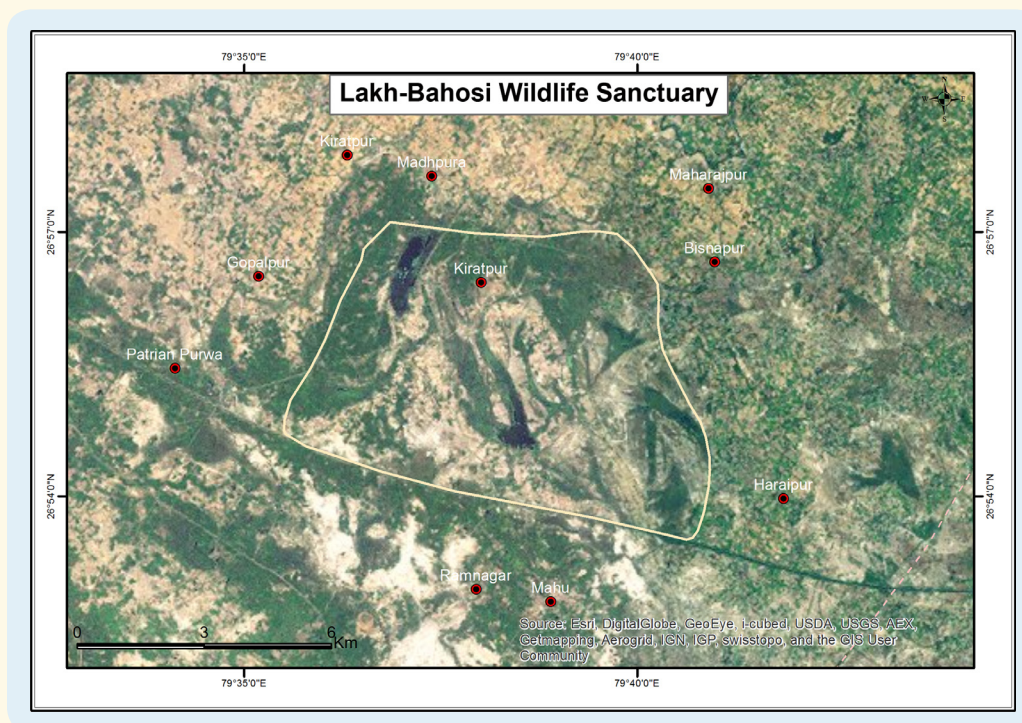
LAKH-BAHOSI WILDLIFE SANCTUARY

IN-UP-09

IBA Site Code	: IN-UP-09	Area	: 8,024 ha
State	: Uttar Pradesh	Altitude	: Not available
District	: Farrukhabad	Rainfall	: c. 900 mm
Coordinates	: 27° 30' 00" N, 79° 30' 00" E	Temperature	: 4 °C to 40 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in March 1988.



GENERAL DESCRIPTION

Lakh-Bahosi Wildlife Sanctuary is c. 38 km from the historic city of Kannauj. The sanctuary is formed by two oxbow jheels near the village Bahosi. Both the jheels, Lakh and Bahosi, are located near the Lower Ganga Canal, so the overflow and seepage of water accumulates in the jheels, resulting in c. 600 ha of shallow wetlands perfectly suitable for waterbirds. By winter, the waterspread is reduced by evaporation and drainage. Nonetheless, at least 400 ha in the deeper parts still retain enough water to attract at least 50,000 waterfowl (Rahmani & Arora 1992). Apart from these two jheels, there are numerous wetlands beside the canal in an area c. 8,000 ha. To protect them, the Uttar Pradesh government declared 8,023 ha as a sanctuary, including forest land, village land, agricultural fields, and revenue lands. A major part of the sanctuary (5,300 ha) is private land.

The area has been identified as an Important Bird Area due to the presence of globally Threatened species such as the Greater Spotted Eagle *Aquila clanga*, Sarus Crane *Grus antigone*, and congregations of about 50,000 waterbirds.

Lakh-Bahosi has great potential to become a Ramsar Site, as it qualifies for Ramsar Criteria 2 and 5 (Islam & Rahmani 2008). The Wetland Division of the Ministry of Environment and Forests, Government of India, has identified Lakh-Bahosi under the Wetland Conservation Programme. The Sálim Ali Centre for Ornithology and Natural History, Coimbatore (SACON), has also recommended this wetland to be declared as a Ramsar Site (Prasad *et al.* 2004).

AVIFAUNA

More than 240 species of birds are reported from Lakh-Bahosi WLS (Chaturvedi 1990–1999). More than 100 Sarus Crane have been counted during a visit in 2008–2009. Besides

the large congregations of waterfowl, some easily exceeding their 1% biogeographic threshold, this IBA also has five globally Threatened and 11 Near Threatened species.

A pair of Black-necked Stork *Ephippiorhynchus asiaticus* is regularly seen in Bahosi, and probably breeds in the area. More than 400 Bar-headed Goose *Anser indicus* were seen a decade ago (Rahmani & Arora 1992). Their number is reported to have gone up, thanks to good protection.

Since the beginning of the year 2009, fortnightly counts of waterbirds have been conducted in Lakh-Bahosi, using the total count method, by a BNHS team during a project on avian flu surveillance. A total of 65 species of birds were recorded during the study period in Lakh-Bahosi (Rahmani *et al.* 2010). In the winter of 2008–2009, the highest number of waterbirds, i.e., 33,777, was recorded in the second fortnight count of January 2008, while the lowest winter count was in the first fortnight of March (3,514), when the birds had already started departing for their breeding ground. In summer, very few birds are left as most of the wetland dries up. For example, the team counted only 124 birds in the first fortnight of June. In winter 2009–2010, the highest number of waterbirds (25,864) was recorded in the second fortnight count of November and the lowest number (10,704) in the first fortnight count of January 2010. Out of 65 species of waterbirds that were recorded in Lakh-Bahosi, 15 were winter visitors belonging to Family Anatidae. The maximum species of anatids (15) were recorded in winter, which declined (to 9) in summer.

The maximum proportion of the population of waterbirds in the winter 2008–2009 was represented by Northern Pintail *Anas acuta* (60.4%), Northern Shoveller *Anas clypeata* (20.9%), Greylag Goose *Anser anser* (2.9%), and

CRITICALLY ENDANGERED	
Red-headed Vulture	<i>Aegypius calvus</i>
ENDANGERED	
Black-bellied Tern	<i>Sterna acuticauda</i>
VULNERABLE	
Pallas's Fish-eagle	<i>Haliaeetus leucogaster</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Pallid Harrier	<i>Circus macrourus</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

Common Teal *Anas crecca* (1.9%). Great White Pelican *Pelecanus onocrotalus* was recorded in the sanctuary in winter and summer seasons, and its maximum population (106 individuals) was recorded in March 2009, which declined to 24 and 6 in the first and second counts in April. A maximum of 62 individuals of Great White Pelican was recorded in February 2010.

About 120 Sarus Crane were recorded in May 2009 when there was still some water left in the wetland. Four species of storks, namely Painted Stork *Mycteria leucocephala*, Asian Openbill *Anastomus oscitans*, Asian Woollyneck *Ciconia episcopus*, and Black-necked Stork *Ephippiorhynchus*



This is a well-protected complex of two major wetlands, Lakh and Bahosi, where sometimes more than 20,000 waterfowl are found in winter. More than 100 Sarus Cranes are seen in this large Sanctuary of nearly 8,024 ha

asiaticus; four species of pochards, namely Red-crested Pochard *Netta rufina*, Common Pochard *Aythya ferina*, Ferruginous Duck *Aythya nyroca*, and Tufted Pochard *Aythya fuligula*, and 10 species of waders were recorded at Lakh-Bahosi. The large congregation of waterbirds in Lakh-Bahosi wetland in winter was mainly due to migratory or winter visitors. In summer and monsoon, the resident waterbirds are highly dispersed.

The fluctuation in population of waterbirds was highest in January, which is the peak winter season and because of inward and outward movement of birds in the surrounding wetlands. There was maximum diversity of waterbirds in winter months and also maximum population fluctuations at the same time. In the beginning of the winter season, when migratory waterfowl start arriving from their breeding grounds, there is abundant food, which starts declining by January when they also start moving to other suitable wetlands, showing maximum variation in their population (Rahmani *et al.* 2010).

OTHER KEY FAUNA

Lakh-Bahosi was established for the protection of waterfowl. There are not many mammals of conservation interest present. Among the large mammals, only Bluebull *Boselaphus tragocamelus* is found in abundance and is an important crop pest. Jungle Cat *Felis chaus*, Golden Jackal *Canis aureus*, Black-naped Hare *Lepus nigricollis*, and other mammals have also been recorded.

LAND USE

- Nature conservation and research
- Water management
- Agriculture

THREATS AND CONSERVATION ISSUES

- Grazing
- Fisheries
- Grass collection

Management of this protected area is difficult, since a major part of it belongs to private landowners. Illegal hunting and bird trapping has been reported occasionally. While Lakh jheel is nearly free of weeds, Bahosi is heavily infested with *Ipomoea*.

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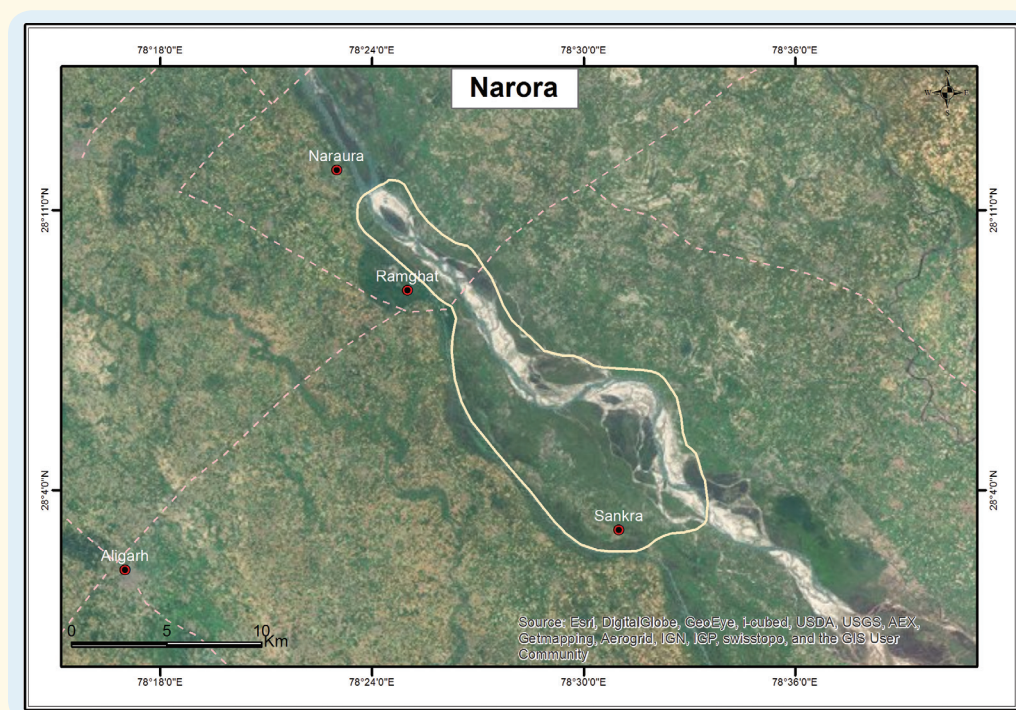
NARORA

IN-UP-10

IBA Site Code	: IN-UP-10	Rainfall	: 1,100 mm
State	: Uttar Pradesh	Temperature	: 1 °C to 45 °C
District	: Bulandshahr	Biogeographic Zone	: Gangetic Plain
Coordinates	: 28° 14' 15" N, 78° 24' 18" E	Habitats	: Riverine Vegetation, Freshwater Swamp, Grassland, Semi-deciduous Forest (Exclusion zone of Narora Atomic Power Station)
Ownership	: Irrigation Department, District Administration, NPCIL		
Area	: 12,700 ha		
Altitude	: 184 msl		

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥ 20,000 waterbirds)

PROTECTION STATUS: Not officially protected, some part declared Ramsar Site No. 1574 in 2005.



GENERAL DESCRIPTION

Narora, which is situated on the River Ganga between Karnabas and Ramghat, includes the total catchment area of Narora Barrage or the Lower Ganga Barrage, and the marshes and wetlands situated along the river banks. The site also includes the areas adjoining the Ganga 1,000 to 2,000 m from each bank. The total area of this IBA site is c. 12,700 ha. This site is named after a small town of the same name. In 2005, the stretch from Brijghat to Narora Barrage was declared a Ramsar site. The site qualifies for Ramsar Criteria 2 (wetland supports threatened ecological communities) and Criteria 5 (wetland regularly supports 20,000 or more waterbirds). It qualifies as Ramsar Wetland Type M (perennial river) (Islam & Rahmani 2008).

The total catchment area of Narora Barrage is 3,251 ha, and its total length is 922 m. The main purpose of the barrage is to supply water to the Lower Ganga Canal and Parallel Lower Ganga Canal for irrigation, and also to Narora Atomic Power Station for cooling.

The reservoir attracts thousands of waterbirds, and there are many lakes and jheels in its vicinity, where resident waterfowl are found. During winter and summer, when the water level is low, a large number of islands appear in the reservoir and all along the Ganga. These islands and sand bars provide safe resting places for ducks, geese, cranes, and other birds. Terns, lapwings, and Indian Skimmer *Rynchops albicollis* breed on these islands during summer (Rahmani 1981).



DHRITIMAN MUKHERJEE

Although many globally Threatened and Near Threatened species are found in Narora, and the duck numbers could go up to 20,000 in winter, the trigger species of this IBA are Indian Skimmer *Rhynchops albicollis* and Black-bellied Tern *Sterna acuticauda* that breed on sandy islands in the Ganga River

AVIFAUNA

Rahmani (1981) identified 120 species of birds in and around Narora Reservoir alone, while S. Behera (*pers. comm.* 2003) listed 133 species in a much larger area. A unique bird counting programme, namely Narora Bird Marathon, has been initiated in this IBA for wetland birds. This was started in 2011, and five consecutive bird marathons have been conducted since then. The species checklist has now gone up to 296 (Raja Mandal, *pers. comm.* 2014).

The exclusion zone of the Nuclear Power Plant at Narora,

CRITICALLY ENDANGERED

White-rumped Vulture (old record)	<i>Gyps bengalensis</i>
Long-billed Vulture (old record)	<i>Gyps indicus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

VULNERABLE

Greater Spotted Eagle (old record)	<i>Clanga clanga</i>
Pallas's Fish-eagle (old record)	<i>Haliaeetus leucoryphus</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
River Tern	<i>Sterna aurantia</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Great Thick-knee	<i>Esacus recurvirostris</i>

which is an area of c. 822 ha around the stack, can be subdivided into three types of habitat: i. Semi- deciduous Forest, ii. Grassland, and iii. Wetland. The exclusion zone provides a well-protected place for many bird species. In 2012, a bird census was undertaken by point count method and the total number of species observed was 118 (Pushpakar *et al.* 2012).

Several pairs of Sarus *Grus antigone* breed in the area. During winter, thousands of waterfowl, especially diving ducks, are seen in the main reservoir. Flocks of several thousand Common Pochard *Aythya ferina*, Red-crested Pochard *Rhodonessa rufina*, Tufted Pochard *Aythya fuligula*, and White-eyed Pochard or Ferruginous Duck *Aythya nyroca* are not uncommon. Sometimes, pure flocks of two to three thousand Red-crested Pochard are found. There are not many sites in India where such flocks are seen now.

Up to seven Pallas's Fish-eagle *Haliaeetus leucoryphus* were counted in 1980 (Rahmani 1981), but their present status is not known. Similarly, several pairs or individuals of Black-necked Stork *Ephippiorhynchus asiaticus* were seen in the jheels and shallow areas of the reservoir, but now it has become uncommon. One pair has been observed nesting inside the Exclusion Zone boundary of the power station since the past five years. Small temporary islands and sand bars, formed due to decrease in water level, could provide ideal habitats for summer breeding species such as the Indian Skimmer *Rhynchops albicollis*, River Tern *Sterna aurantia*, Black-bellied Tern *S. acuticauda*, Spur-winged Plover or River Lapwing *Vanellus duvaucelii*, and pratincoles *Glareola* spp., but no research has been conducted on this aspect. In

the winter of 2014–2015, Raja Mandal (*pers. comm.* 2014) reported a congregation of 135 Indian Skimmer near Rajghat Bridge on a desolate sand bar.

The Narora Reservoir, adjoining jheels, and a stretch of the Ganga from Narora Barrage to Karnabas could easily hold more than 20,000 waterfowl in winter, thus qualifying the site for A4iii criteria. There are very few riverine protected areas in India. On this account also, Narora is significant.

White-rumped Vulture *Gyps bengalensis* and Long-billed Vulture *Gyps indicus* were once very common, but none were sighted during the annual Bird Marathon from 2011 to 2014. However, the Endangered Egyptian Vulture *Neophron percnopterus* is still seen in small numbers. For example, three were sighted in January 2011, ten in February 2012, and five in February 2014. Similarly, Pallas's Fish-eagle *Haliaeetus leucoryphus* has also disappeared as none has been sighted in recent years.

The Endangered Black-bellied Tern *Sterna acuticauda* nests on the sandy islands in the river, along with Indian Skimmer *Rynchos albicollis*, River Lapwing *Vanellus duvaucelii*, and other species. During the Bird Marathon, 17 were seen in January 2011, and 51 each in February 2012 and February 2013. The number of River Lapwing is fairly satisfactory, as can be seen from the following numbers: 51 in January 2011, 129 in February 2012, 89 in February 2013, and 50 in February 2014. The River Tern *Sterna aurantia*, which is now considered as Near Threatened, is also found in good numbers: 174 in January 2011, 134 in February 2012, and 50 in February 2013.

OTHER KEY FAUNA

Narora Reservoir and a stretch of c. 60 km on the River Ganga are extremely important for the protection of the Gangetic Dolphin *Platanista gangetica*, 11 species of freshwater turtles, and for Mugger *Crocodylus palustris* and Gharial *Gavialis gangeticus*. The Smooth Indian Otter *Lutra perspicillata*, Fishing Cat *Prionailurus viverrina*, and Hog Deer *Axis porcinus* are other important mammals. There are unconfirmed reports of a small population of Swamp Deer *Cervus duvauceli* surviving on some grass-covered islands.

LAND USE

- Irrigation
- Farming
- Fishing
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Uncontrolled fishing
- Poaching
- Agricultural activity on islands
- Pesticides from farmlands
- Industrial pollution
- Sand mining

Till the mid 1970s, Narora Reservoir and its adjoining jheels were ideal hunting grounds for poachers, who would use the Irrigation Department motorboats to reach the birds. However, due to protests by conservationists, poaching by influential people was stopped. The Nature Conservation Society of Aligarh suggested to the government that Narora Reservoir from the Barrage to Rajghat, a stretch of c. 7 km, be declared as a bird sanctuary (Rahmani 1981), but sadly, this has not been done. WWF-India has revived and modified this proposal to declare the stretch between Karnabas and Ramghat as a Dolphin Sanctuary (S. Behera, *pers. comm.* 2003). In 2005, the stretch from Brijghat to Narora Barrage was declared a Ramsar site.

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Raja Mandal, Jitendra Pandey, P.D. Mishra, Amit Mishra, M. Muralidhar Rao, Asif Iqbal, Rajesh Sharma, Satpal Singh, Sachin Gaur.

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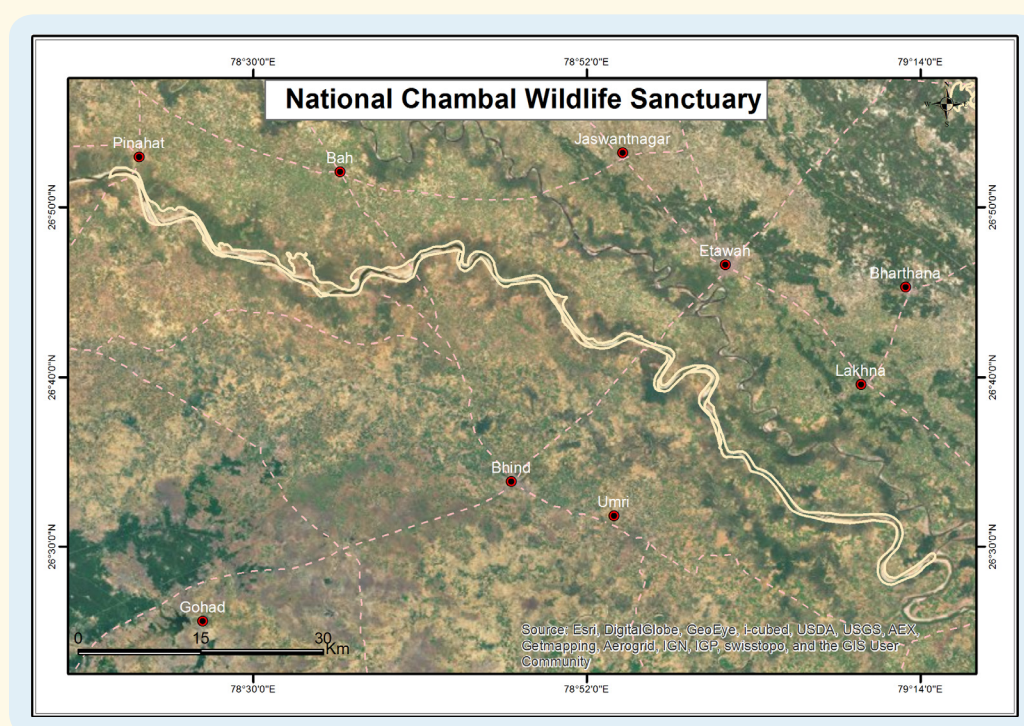
NATIONAL CHAMBAL WILDLIFE SANCTUARY

IN-UP-11

IBA Code	: IN-UP-11	Altitude	: Not available
State	: Uttar Pradesh	Rainfall	: 880 mm
District	: Agra, Etawah, Auraiya	Temperature	: 1 °C to 48 °C
Coordinates	: 26° 48' 41" N, 78° 40' 55" E	Biogeographic Zone	: Semi-arid
Ownership	: State	Habitats	: Riverine Vegetation, Wetland
Area	: 63,500 ha		

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥ 20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in 1979.



GENERAL DESCRIPTION

The Chambal Wildlife Sanctuary lies in three states, Rajasthan, Madhya Pradesh, and Uttar Pradesh, stretching from Kota in Rajasthan to the confluence of Chambal river with the Yamuna at Bhareh in District Etawah. In Uttar Pradesh, National Chambal Sanctuary (NCS) extends over three districts namely Agra, Etawah, and Auraiya. In 1979, under an initiative of reintroduction of Gharial *Gavialis gangeticus* bred in captivity and for *in situ* conservation, a stretch of 400 km of the river Chambal and a 1 to 6 km swathe of the ravines on either side of the river were chosen and declared as sanctuary, under the Indian Wildlife (Protection) Act, 1972. The NCS, lying in the Indus-Ganga monsoon forest belt, begins downstream of the Kota barrage in Rajasthan. The lower limit of the sanctuary is near Pachnada, some 5 km after the confluence of the Chambal

and the Yamuna at Bhareh in Uttar Pradesh. The NCS covers an area of 635 sq. km in Uttar Pradesh, 320 sq. km in Madhya Pradesh, and 280 sq. km in Rajasthan. Out of its total area in Uttar Pradesh, 23,500 ha is forest land and the rest belongs to *gram samaj* (village council), revenue, and private land holders. The Chambal is a perennial river originating in the Vindhya Range in Madhya Pradesh. Within the sanctuary, the river flows through areas of deeply eroded alluvium, rapids over rock beds, sand banks, and gravel bars along with steep banks and bends. Numerous temporary watercourses provide a variety of habitats (Scott 1989).

The Chambal Sanctuary was mainly created to provide protection to the Endangered Gharial *Gavialis gangeticus*, Crocodile, Gangetic Dolphin *Platanista gangetica*, and various species of rare turtles. The Chambal river forms

the core of the sanctuary, and the sandy beach and forested areas along the banks to a distance of one km from the buffer zone. In Uttar Pradesh, it covers 180 km stretch of Chambal river.

AVIFAUNA

The area is of importance for both resident and migratory waterfowl, especially Spot-billed Pelican *Pelecanus philippensis*, Rosy Pelican *Pelecanus onocrotalus*, and Dalmatian Pelican *Pelecanus crispus*, Common Teal *Anas crecca*, Northern Pintail *A. acuta*, Bar-headed Goose *Anser indicus*, Brahminy Shelduck *Tadorna ferruginea*, Red-crested Pochard *Netta rufina*, and Indian Skimmer *Rynchops albicollis*. Small numbers of Black-necked Stork *Ephippiorhynchus asiaticus*, Common Crane *Grus grus*, Sarus Crane *G. antigone*, and Black-bellied Tern *Sterna acuticauda* are also found along the river (Scott 1989). Greater Flamingo *Phoenicopterus roseus* and Lesser Flamingo *Phoeniconaias minor* are among the species that regularly visit the sanctuary. National Chambal Sanctuary is one of the most important bird areas in India, being the breeding site of the Indian Skimmer. It is one of the last remnant colonial nesting grounds for Indian Skimmer and Small Indian Pratincole *Glareola lactea*. This wetland has been listed as a Priority 5 (high priority) wetland, i.e., a wetland with high ecological and socio-economic potential but poor data availability (Samant 2000).

Other key avifauna are Eurasian Spoonbill *Platalea leucorodia*, Black-headed Ibis *Threskiornis menalocephalus*, Black Ibis *Pseudibis papillosa*, and Glossy Ibis *Plegadis falcinellus*, Comb Duck *Sarkidiornis melanotos*, and a few species of buzzards and harriers. Great-horned Owl *Bubo bubo* is noticeable in the crevices of ravines. More than 325 species of birds have been reported from the sanctuary. Updated checklists of the birds of National Chambal WLS have been prepared from time to time.

OTHER KEY FAUNA

This sanctuary was established to rehabilitate the Gharial. Good protection during the last 30 years has also benefited the Smooth Indian Otter *Lutra perspicillata*, Marsh Crocodile *Crocodylus palustris*, and the Gangetic Dolphin *Platanista gangetica*. Terrestrial mammals seen are the Nilgai *Boselaphus tragocamelus*, Wild Boar *Sus scrofa*, Porcupine *Hystrix indica*, Black-naped Hare *Lepus nigricollis*, Indian Fox *Vulpes bengalensis*, and Golden Jackal *Canis aureus* (Anon. 2011–2012). The Indian Wolf *Canis lupus* is reported from the surrounding areas. In a recent survey, the presence of Leopard *Panthera pardus* with cubs has been reported.

Chambal is also famous for several species of turtles such as *Lissemys punctata*, *Chitra indica*, *Kachuga kachuga*, *K. dhongoka*, *K. tentoria*, *Trionyx gangeticus*, and *Hardella*

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>
VULNERABLE	
Dalmatian Pelican	<i>Pelecanus crispus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Sarus Crane	<i>Grus antigone</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Indian Skimmer	<i>Rynchops albicollis</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Spot-billed Pelican	<i>Pelecanus philippensis</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Great Thick-knee	<i>Esacus recurvirostris</i>
River Lapwing	<i>Vanellus duvaucelli</i>
River Tern	<i>Sterna aurantia</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

thurjii. Moreover, out of 28 freshwater Indian turtle species, 15 species have been recorded from the state of Uttar Pradesh, out of which eight species are found in the Chambal river sanctuary in Uttar Pradesh. Chambal river also supports more than 40 species of fish, and is an important breeding ground for them. As fishing is totally prohibited (to safeguard the food of Gharial, Marsh Crocodile, Otter, and Dolphin), the fish fauna has improved.

LAND USE

- Nature conservation and research
- Tourism and recreation
- Reserve forest
- Agriculture

THREATS AND CONSERVATION ISSUES

- Irrigation
- Sand mining
- Drainage
- Firewood collection
- Poaching
- Erosion



DHRITIMAN MUKHERJEE

National Chambal Sanctuary in three states was declared for the protection and propagation of Critically Endangered Gharial *Gavialis gangeticus* but the Sanctuary is also important for its bird life. Till now, 11 globally Threatened and 17 Near Threatened species have been identified from this site, most of them in significant numbers. In winter, more than 20,000 ducks are found in the Sanctuary

- Dogs (harmful to breeding birds)
- Fishing
- Construction of dams
- River transportation
- Use of agrochemicals

The major problem of this riverine sanctuary is illegal mining of sand. Although the Forest Department is trying to promote tourism, the industry has not picked up because of security concerns, as this area used to be a notorious hideout of bandits. Patrolling the long river stretch by boat poses security problems to Forest Department staff due to threat from illegal hunters. For its water upliftment project, the Irrigation Department has built a huge pump in the sanctuary at Pinahat, which reduces water level during the summer, joining nesting islands to the bank. This adversely affects the breeding of the Indian Skimmer. Very few birds were seen to breed between 2001–2003. The degree of illegal fishing varies, depending on the interest of the concerned forest official. However, the biggest conservation issue for birdlife is the cultivation of Watermelon *Citrullus lanatus*, Muskmelon *Cucumis melo*, Cucumber *C. sativus*, and other summer vegetables, which disturbs the nesting islands of

Indian Skimmer, River Tern, Black-bellied Tern, and other summer breeders. Due to decrease of water in the river, most of these sandy islands become easily accessible to foxes, dogs, and cats, which sometimes destroy whole nesting colonies. The increasing demand from nearby towns to draw water for drinking and irrigation is a long-term threat. There is a proposal to draw water through pumps to provide potable water to Dholpur, Bharatpur, and 990 villages.

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K.S.Gopi Sundar, Asad R. Rahmani, R.K Sharma, R.G. Rao, Gurmeet Singh, Neeraj Srivastav.

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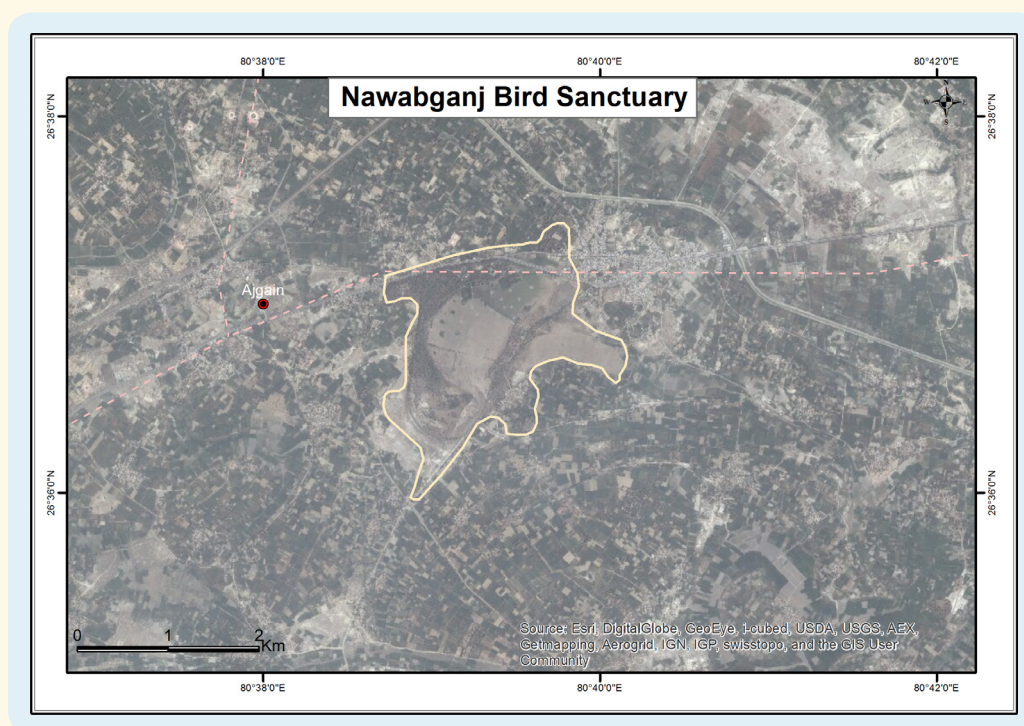
NAWABGANJ BIRD SANCTUARY

IN-UP-12

IBA Site Code	: IN-UP-12	Area	: 225 ha
State	: Uttar Pradesh	Altitude	: 110 msl
District	: Unnao	Rainfall	: <1,000 mm
Coordinates	: 26° 34' 60" N, 80° 40' 00" E	Temperature	: 1 °C to 48 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in 1990.



GENERAL DESCRIPTION

The Nawabganj Priyadarshini Bird Sanctuary is located on the Kanpur-Lucknow highway, 45 km east of Lucknow, near the village Nawabganj in Hasanganj *tehsil* of Unnao district. The sanctuary has an interesting history. Till 1974, it was an open, shallow wetland, which attracted thousands of waterfowl and drew many hunters and trappers. These waterfowl used to be supplied to the bird markets of Lucknow, Kanpur, Nawabganj, Unnao, and other nearby towns. In 1972, the Indian government enacted the Wildlife (Protection) Act, 1972, which totally prohibited shooting and trapping of wildfowl. In 1974, the Forest Department declared Nawabganj as a sanctuary and took over the land. To make it “more attractive to birds”, they planted thousands of trees and built mounds as in Keoladeo National Park at Bharatpur (Rajasthan). For the first few years, the wildfowl population increased dramatically, and

storks, cormorants, egrets, and darters started breeding on the trees growing on mounds. This further encouraged the Forest Department to go on a plantation binge. A 5 km road was constructed circling the sanctuary, motels and hotels came up and tourism was encouraged. Livestock grazing was totally stopped to prevent “trampling of nests”. There were plans to maintain the water level throughout the year. Large-scale plantation and the ban on grazing resulted in accumulation of biomass, which decreased the depth of the wetland. Slowly, this open waterspread became choked with vegetation. Gone were the skeins of Barheaded Geese *Anser indicus* and Greylag Geese *Anser anser* and huge flocks of Northern Pintail *Anas acuta*, Garganey *Anas querquedula*, Northern Shoveller *Anas clypeata*, and Gadwall *Anas strepera*. The wetland that was maintained by grazing and occasional drying is now a small puddle, completely choked with Water Hyacinth and other vegetation. The Forest

Department regularly attempts to clear the vegetation, but unless the earlier water regime is restored, it will be difficult to bring back the glory of this important waterfowl refuge, a victim of poor management.

The jheel is fed by monsoon run-off and has an average depth of 1.0–1.5 m at maximum water levels. The water level fluctuates considerably, and much of the lake dries out by early summer.

Based on the ecological, biological, and tourism importance of Nawabganj Bird Sanctuary, Islam & Rahmani (2008) suggested that it be declared as a Ramsar Site. The IBA fulfils many Ramsar Criteria such as Criteria 2 (wetland supports threatened ecological communities), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies). Nawabganj Jheel is also included in the list of Wetlands of National Importance prepared under the Wetland Conservation Programme of the MoEF.

AVIFAUNA

This lake is important for resident and migratory waterfowl. More than 200 species have been identified (Rahmani1992). Large waterbirds started nesting here

ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Sarus Crane	<i>Grus antigone</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

in 1980 and there is now a mixed heronry of Oriental Darter *Anhinga melanogaster*, Black-crowned Night Heron *Nycticorax nycticorax*, many species of egrets and cormorants, and Eurasian Spoonbill *Platalea leucorodia*. Other resident species include Purple Moorhen or Swampphen *Porphyrio porphyrio*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, and Bronze-winged Jacana *Metopidius indicus*. The lake is important for various species of Anatidae and Coot *Fulica atra*. Nawabganj also has a number of raptors such as Pallas's Fish-eagle *Haliaeetus leucorophus*, Greater



DRITIMAN MUKHERJEE

Once the Sanctuary was notified in 1974, the main feature of Nawabganj *jheel* – open sheet of shallow water – was changed by the Forest Department by intensive plantation. Now efforts are being made to remove excessive vegetation. Although thousands of ducks are still found in winter, the earlier number of hundreds of thousands is missing. Perhaps with removal of more trees and opening of the jheel, we may again attract more waterfowl

Spotted Eagle *Clanga clanga*, and Western Marsh Harrier *Circus aeruginosus*.

The sanctuary was known for its great congregations of waterbirds during the winter months. During the last 8–10 years, very good management work has been done, particularly to make the site attractive to tourists and birds.

Two to three pairs of Sarus *Grus antigone* breed in the sanctuary. During a Sarus count in 1999 (Choudhury *et al.* 1999), a pair with a juvenile was seen inside the sanctuary, and two pairs and one juvenile were seen in the surrounding fields. A pair of Black-necked Stork *Ephippiorhynchus asiaticus* is also seen, sometimes with juveniles, but its nest has not been discovered. Other Near Threatened species are listed in the table. The Endangered Egyptian Vulture *Neophron percnopterus* is regularly seen around slaughter houses and tanneries in Unnao town, and therefore, often seen in Nawabganj. However, White-rumped Vulture *Gyps bengalensis* that was abundant 20 years ago is rarely seen now.

OTHER KEY FAUNA

With protection and afforestation, Jungle Cat *Felis chaus* and Golden Jackal *Canis aureus* have appeared, along with the Bluebull *Boselaphus tragocamelus*. Spotted Deer or Cheetal *Axis axis* has been introduced to enhance the tourism value of the sanctuary.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Introduction of unsuitable plant species
- Disturbance to birds
- Infestations by weeds
- Siltation
- Pollution from pesticides
- Lotus harvesting

This wetland has been listed by Samant (2000) as a priority (high priority) wetland, that is wetlands with high ecological and socio-economic potential, but with poor data availability.

Pollution from adjoining industries drains into the lake due to its topographical disadvantage. The lake is also heavily infested with weeds such as *Eichornia crassipes* choking the waterways, resulting in decrease in dissolved oxygen level which is crucial for the survival of aquatic plant and animal life.

It is important to restore Nawabganj WLS to its former habitat status, i.e. open sheet of water, through the removal of excessive trees from the surrounding areas, allowing summer grazing of livestock, perhaps on rotational basis, and regular removal of Water Hyacinth.

In some years when the rainfall is insufficient, the wetland remains dry, except for some pools. This is the time to remove excessive biomass either by physical removal by humans or by regulated cattle grazing.

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Asad R. Rahmani, Neeraj Srivastav.

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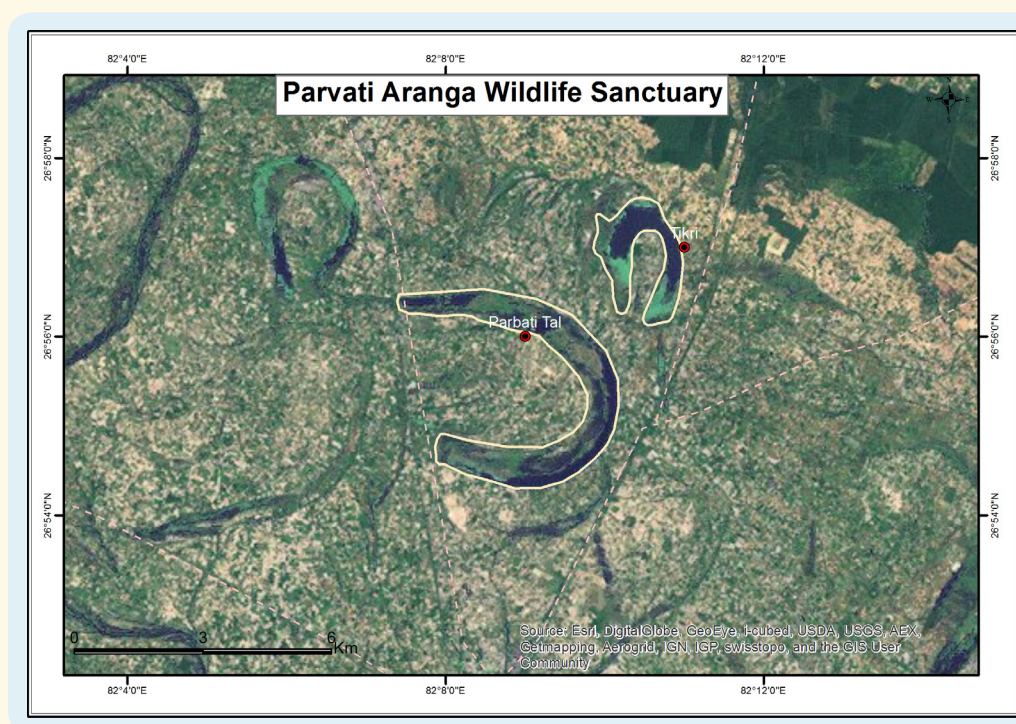
PARVATI ARANGA WILDLIFE SANCTUARY

IN-UP-13

IBA Site Code	: IN-UP-13	Area	: 1,084 ha
State	: Uttar Pradesh	Altitude	: Not available
District	: Gonda	Rainfall	: Not available
Coordinates	: 27° 25' 00" N, 82° 19' 00" E	Temperature	: 4 °C to 48 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in May 1990. IBA in Danger.



GENERAL DESCRIPTION

Parvati and Aranga are two connected waterbodies comprising an area of 1,084 ha, 22 km from the temple town of Ayodhya. They are rainfed lakes in a deep natural depression in the Gangetic plains of the Terai region. Parvati Aranga Wildlife Sanctuary was established in 1990. However, core and buffer zones have not been demarcated even now. Although no village is located in the immediate vicinity of the sanctuary, agricultural fields have reached the edge of the wetland. According to the Forest Department, many agriculturists have encroached on forest land. For proper management, settlement of rights, and demarcation of the true boundaries of the sanctuary are required. It is essential to involve local people in the management of the wetland, so that both people and birds benefit.

The sanctuary lacks an interpretation centre and there are no publicity pamphlets on this important wetland.

No visitor record is kept. The staff is not trained in birdwatching.

AVIFAUNA

Parvati Aranga Sanctuary was well known for large numbers of waterbirds during winter. More than 150 bird species have been recorded from this sanctuary (Suhelwa Wildlife Division, 2014). Earlier, more than 20,000 waterbirds were reported by the Forest Department, hence this criterion was used to identify this wetland as an IBA. Now the situation is very different. During a visit by a BNHS team in mid November 2014, less than 100 waterbirds were seen. A few Little Cormorant *Microcarbo niger*, two Bronze-winged Jacana *Metopidius indicus*, and 20–30 Lesser Whistling Duck *Dendrocygna javanica* were seen. In the reed beds, more than 500 Barn Swallow *Hirundo rustica* were recorded foraging.



DHRITIMAN MUKHERJEE

Parvati Aranga is another IBA in Danger due to decrease of waterfowl in the last 10 years, mainly due to intensive biotic pressures. Although Sarus Crane is still found in good numbers (>100) and breeds in the area, waterfowl number has gone down drastically. However, with better management practices, the situation can be salvaged. Thanks to the spread of Water Hyacinth, species such as Purple Swampphen *Porphyrio porphyrio* (above) have increased

The population of Sarus Crane *Grus antigone* is more than 200. Choudhury *et al.* (1999) counted 112 Sarus, including 31 juveniles. They consider Parvati Aranga as an important site for Sarus conservation in India.

VULNERABLE

Sarus Crane

Grus antigone

OTHER KEY FAUNA

Not available

LAND USE

- Water management
- Nature conservation
- Agriculture

THREATS AND CONSERVATION ISSUES

- Disturbance to birds from fishing
 - Drainage
 - Pesticides
 - Extensive fishing
 - Encroachment
- Till 1996, the Fisheries Department used to auction the

fish in the area, which has now stopped. Fishing, however, continues illegally. Birds are trapped with nets, but not to any significant extent. During a BNHS survey in November 2014, many fishing boats/tubes were seen. The IBCN State Coordinator Neeraj Srivastav corroborates this from his similar experience.

The sanctuary has no weeds, but on the banks some wild *Cannabis* has made an appearance. This needs to be removed to maintain the wetland. The pesticide used in the surrounding fields runs off into the lakes, but its impact on birds has not been assessed.

Considering the threats to this wetland from fishing and encroachment, and the decrease of birdlife, we are considering this IBA as threatened.

KEY CONTRIBUTORS

V.P. Singh, K.S. Gopi Sundar, Rajat Bhargava.

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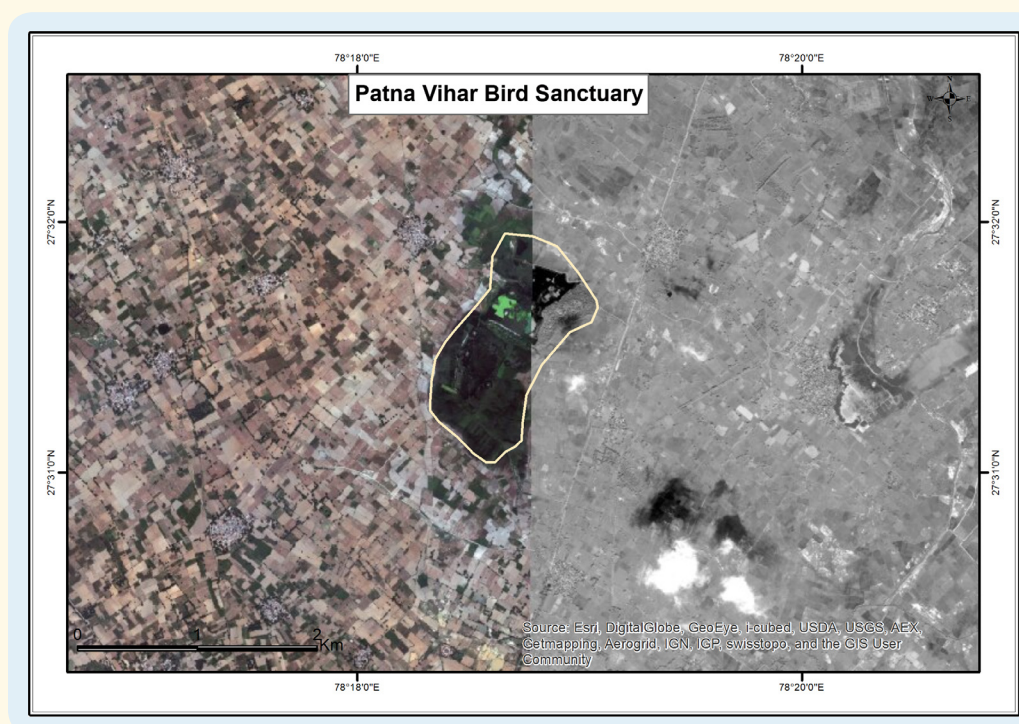
PATNA VIHAR BIRD SANCTUARY

IN-UP-14

IBA Site Code	: IN-UP-14	Area	: 109 ha
State	: Uttar Pradesh	Altitude	: Not available
District	: Etah	Rainfall	: 800–1,000 mm
Coordinates	: 27° 34' 60" N, 78° 45' 00" E	Temperature	: 4 °C to 48 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i (1% biogeographic population), A4iii (congregation: ≥ 20,000 waterbirds)

PROTECTION STATUS: Bird Sanctuary, established in September 1990.



GENERAL DESCRIPTION

Patna Vihar Bird Sanctuary is c. 6 km from Jalesar town in Etah district on the Jalesar-Sikandrarao road. An area of 108 ha was declared as a Bird Sanctuary in 1991 under the Wildlife (Protection) Act 1972 (Rahmani & Daniel 1997). It is a typical rainfed wetland of the Gangetic plains, being a natural freshwater, shallow depression. The shallow parts of the sanctuary dry up during summer, leaving some puddles in the deeper zones.

Patna Bird Sanctuary is a classic example of how, within a few years of protection, a long-neglected wetland can become one of the finest wetland habitats of the country.

Date Palm *Phoenix sylvestris* in the central part of the sanctuary is one of the most conspicuous features of this IBA. Aquatic vegetation consists of *Hydrilla verticillata*, *Ceratophyllum demersum*, *Vallisneria spiralis*, *Potamogeton crispus*, and *Najas* sp., while surface vegetation consists of

Salvinia, *Azolla*, and *Eichhornia crassipes*. On the fringes of the wetlands, *Ipomea carnea* grows in excess and needs control. *Ipomea aquatica* is also spreading, but it may not be as dangerous as *I. cairica*. While *Nymphoides cristata* and *N. indica* occur naturally, Singhara *Trapa natans* is cultivated in a small part of the wetland.

Islam & Rahmani (2008) have recommended Patna Jheel as a Ramsar Site as it fulfills Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies).

AVIFAUNA

About 180 species of birds have been reported from Patna Sanctuary (Rahmani & Daniel 1997, Ahmad & Javed 2000). Of the 42 species of Family Anatidae from

the Indian subcontinent (Ali & Ripley 1987), 18 species have been reported from the sanctuary. Among these, Comb Duck *Sarkidiornis melanotos*, Cotton Teal or Cotton Pygmy-Goose *Nettapus coromandelianus*, Lesser Whistling Duck *Dendrocygna javanica*, and Spot-billed Duck *Anas poecilorhyncha* are the resident species.

During the peak of winter in December and January, 60,000–70,000 waterfowl are found in the Patna wetland. However, since 2006, waterfowl numbers in winter have declined and the maximum number never exceeded 40,000. This is largely due to lack of sufficient water in the wetland during winter; most of the area remains without water except two portions by March every year. Rosy Pelican *Pelecanus onocrotalus*, Lesser Flamingo *Phoeniconaias minor*, Greater Flamingo *Phoenicopterus roseus*, Black-headed Ibis *Threskiornis melanocephalus*, Glossy Ibis *Plegadis falcinellus*, Eurasian Curlew *Numenius arquata*, Eurasian Spoonbill *Platalea leucorodia*, Osprey *Pandion haliaetus*, Mallard *Anas platyrhynchos*, Bar-headed Goose *Anser indicus*, and Oriental Darter *Anhinga melanogaster* are some of the main attractions of Patna Bird Sanctuary. Species such as Rosy Pelican, Lesser Flamingo, and Greater Flamingo have not been regularly seen whereas Osprey was never recorded during our visits to the sanctuary every year since 2006. Mallard numbers have also declined over the years in the area.

The Black-necked Stork breeds in the villages surrounding the sanctuary, and a pair with three juveniles was seen

throughout while monitoring the wetland from 2008 to 2010 (Rahmani *et al.* 2010).

Anatidae is the most abundant among all the families recorded. Northern Pintail *Anas acuta* is most numerous, with about 52,000 individuals during the peak time in one census (Ahmad & Javed 2000). This was followed by Common Pochard *Aythya ferina* 12,000; Gadwal *Anas strepera* 5,500; Northern Shoveller *A. clypeata* 4,200; and Garganey *A. querquedula* 1,700. Most of these figures are above 1% biogeographical population threshold of these species (see Wetlands International 2012).

Among the Phalacrocoracidae, Little Cormorant *Phalacrocorax niger* is abundant, with about 500 individuals, followed by Large Cormorant *Phalacrocorax carbo*, and Darter *Anhinga melanogaster*. Oriental Eurasian Coot *Fulica atra* is also abundant, with about 6,300 birds in one census (Ahmad & Javed 2000). During summer, when most of the smaller wetlands become completely dry, a large number of Sarus Crane *Grus antigone*, sometimes numbering between 200 to 300, congregate in Patna Jheel, where some water is left in deeper parts, which serve as an important refuge for this species during the hot, dry summer.

Earlier, richness and diversity of waterbirds was highest at the end of April but now it is minimum by April because by this time of the year, water remains only in one portion of the wetland. Waders such as Black-tailed Godwit *Limosa limosa* are sometimes seen in large flocks in April. It appears



Patna Jheel used to attract more than 100,000 waterfowl but now the number has gone down to 40,000-50,000. It is still an impressive number. The most important “management” is to bring back the jheel to its former glory with minimum intervention. There should be strict ban on any type of plantation in and around Patna Jheel

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Indian Vulture	<i>Gyps indicus</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>
VULNERABLE	
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Asian Woolly-neck	<i>Ciconia episcopus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Pallid Harrier	<i>Circus macrourus</i>
Red-headed Falcon	<i>Falco chicquera</i>
Great Thick-knee	<i>Esacus revurvirostris</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>

that Patna Sanctuary is not only an important refuge but also a stopover site for winter migrants returning to their breeding quarters from peninsular and central India. Waders and other marsh species are far more abundant at the end of April. This is probably due to the development of more shallow areas as the water recedes during the late winter (Ahmed & Javed 2000).

During avian flu surveillance, Patna Jheel and other wetlands of U.P. were monitored from 2008 to 2010 (Rahmani *et al.* 2010). The Anatidae population at Patna Bird Sanctuary was highest in the winter of 2009–2010 and the lowest numbers were recorded in summer 2009 and monsoon 2009. Common Teal *Anas crecca* was the most abundant species during both the winters. Northern Pintail and Northern Shoveller were other common species at this site. Red-crested Pochard *Netta rufina* was only recorded in January 2009.

Phalacrocoracidae population remained constant almost throughout the winter season, and there was no significant variation in their numbers across winter 2008–2009 and winter 2009–2010, whereas in summer and monsoon less than 15 birds were recorded, as the birds move to other areas when there is less water at Patna Jheel. Although this wetland is well protected and water pumps were used to maintain the water level during peak summer season, it could not fulfill the water requirement for such a large wetland (Rahmani *et al.* 2010).

For both the winter seasons (2008–2009 and 2009–2010), the first arrival of migratory birds was noticed in October.

Garganey *Anas querquedula* and Common Teal *Anas crecca* were the early visitors to this sanctuary. Subsequently, Greylag Goose *Anser anser* and Bar-headed Goose *Anser indicus* were sighted in December.

We found a major change in the population of Rallids (moorhens and coots), which were highest in the winter of 2008–2009 and decreased to lowest in summer and monsoon when only 13 and 20 individuals were recorded respectively (Rahmani *et al.* 2010).

Till the mid 1990s, White-backed *Gyps bengalensis* and Long-billed or Indian *Gyps indicus* Vulture were very common but they are hardly seen now. However, the Endangered Egyptian Vulture *Neophron percnopterus* is not uncommon, particularly around villages and carcass dumps.

OTHER KEY FAUNA

Since the establishment of Patna Bird Sanctuary and posting of forest officials, all the wildlife of the area has benefited from protection. Sighting of Golden Jackal *Canis aureus* and Nilgai *Boselaphus tragocamelus* is now quite common. Monitor Lizard *Varanus bengalensis* has also benefited and good numbers are seen on the terrestrial part of the sanctuary.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Plantation
- Tourists and boating
- Invasive species *Eichhornia crassipes*
- Cultivation of Water Chestnut *Trapa natans*
- Litter, non-biodegradable trash
- Pesticide runoff from agricultural fields

One of the greatest threats to this IBA was plantation of exotic trees apparently “for beautification and to provide food to birds”. This threat has been reduced due to timely intervention (Rahmani & Daniel 1997).

Patna Bird Sanctuary is considered a sacred place due to the presence of a temple, so villagers do not allow hunting, resulting in unusual tameness of birds. Since the establishment of the sanctuary, and some restriction on the activities of villagers, such as grass cutting and cultivation of Water Chestnut, the villagers have become somewhat indifferent to the sanctuary. However, this could be minimized if the benefit of wildlife tourism goes directly to the villagers. This IBA is only 80 km from Agra, a major tourist centre of India, and would attract thousands of tourists every year. Local youths could be trained to act as guides, much like in Keoladeo National Park (another IBA) at Bharatpur, Rajasthan.



DHIRTIMAN MUKHERJEE

Sarus Crane *Grus antigone* breeds in and around Patna Jheel and during summer when smaller wetlands are dry, they congregate in Patna Jheel in large numbers

The Forest Department removes weeds such as *Ipomea* and *Eichhornia* spp. from time to time from the sanctuary and likewise silt. In summer 2006, the entire area of the sanctuary was excavated to remove silt and increase water depth (Satish Kumar, *pers. comm.* 2014).

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Asad R. Rahmani, Salim Javed, Sangeeta, Ashfaq Ahmed, Satish Kumar.

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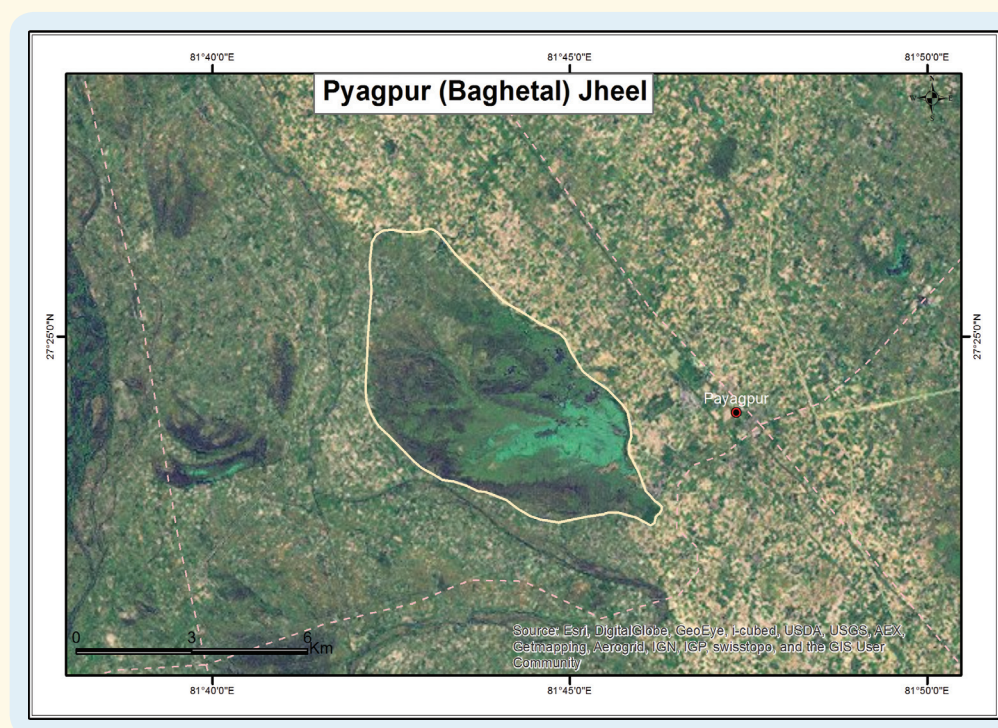
PYAGPUR AND SITADWAR JHEEL

IN-UP-15

IBA Site Code	: IN-UP-15	Area	: 2,950 ha
State	: Uttar Pradesh	Altitude	: 125 msl
District	: Bahraich and Shravasti	Rainfall	: >1,000 mm
Coordinates	: 27° 31' 00" N, 81° 54' 00" E	Temperature	: 4 °C to 40 °C
Ownership	: Revenue and private land	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥ 20,000 waterbirds)

PROTECTION STATUS: Not protected. IBA in Danger.



GENERAL DESCRIPTION

The Pyagpur Jheel (2,800 ha) is a shallow, freshwater lake with associated marshes on the plains between the Rapti and Ghagra rivers. The total circumference of the water body is approximately 42 km. It is an excellent permanent jheel of 1 to 3 m depth, and supports very important fishery. It is a perennial water body but surface water gradually shrinks and remains almost half of the amount accumulated during the peak period of September–October. It has a tropical monsoon climate typical of the Gangetic Plains. It is state-owned, and the surrounding area is private agricultural land.

Sitadwar (150 ha) is a similar shallow freshwater lake with associated marshes, situated some 20 km away on the plains between the Rapti and Ghagra rivers. It is a site of religious pilgrimage and festivals. The Sitadwar Jheel

is somewhat shallow, prone to drying out in the summer. It is state-owned, while the surrounding area is private agricultural land (Islam 2001).

Sitadwar has the usual complement of aquatic vegetation, some floating and emergent plants such as *Ipomea carnea*.

The Pyagpur Jheel bears similar submerged, floating and emergent plants that are typical of the jheel in the Gangetic plains. It is also infested with Water Hyacinth *Eichhcrornia crassipes* and *Ipomea carnea*.

AVIFAUNA

The site is important for migratory and resident waterfowl. Congregations of 100–150 Sarus Crane *Grus antigone* are found in certain months (K.S. Gopi Sunder, *pers. comm.* 2003).

The Siberian Crane *Grus leucogeranus* was reported from Pyagpur jheel nearly 100 years ago (Ali and Ripley 1987). Despite tremendous disturbance due to fishing activities and some bird trapping, this jheel still supports thousands of waterfowl in winter. With better protection and fishing restrictions during some months, the Pyagpur jheel could support 4–5 times more birds than it does today.

In a short survey conducted in Pyagpur Jheel in 1986, Asad Rahmani and Carl D'Silva recorded the following species: Great White Pelican *Pelecanus onocrotalus*, Demoiselle Crane *Grus virgo*, Grey Heron *Ardea cinerea*, Eurasian Spoonbill *Platalea leucorodia*, Lesser Whistling Duck *Dendrocygna javanica*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, Northern Shoveller *Anas clypeata*, Northern Pintail *Anas acuta*, Black-necked Stork *Ephippiorhynchus asiaticus*, Painted Stork *Mycteria leucocephala*, and Asian Openbill *Anastomus oscitans* (Scott 1989). Detailed investigation of avifauna is urgently required for this important waterfowl refuge.

Sitadwar was also surveyed in 1986, by Rahmani and D'Silva, who recorded Great White Pelican *Pelecanus onocrotalus*, Grey Heron *Ardea cinerea*, Eurasian Spoonbill *Platalea leucorodia*, Lesser Whistling Duck *Dendrocygna javanica*, Demoiselle Crane *Grus virgo*, Pheasant-tailed Jacana *Hydrophasianus chirurgus* and Sarus Crane *Grus antigone* (Scott 1989).

VULNERABLE	
Sarus Crane	<i>Grus antigone</i>
NEAR THREATENED	
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Ferruginous Duck	<i>Aythya nyroca</i>

OTHER KEY FAUNA

No terrestrial mammal of any conservation significance occurs in Pyagpur or Sitadwar wetlands. If fishery is controlled, these wetlands could become good habitats for the Smooth Indian Otter *Lutra perspicillata*.

As Sitadwar is a wetland and surrounding areas are under intense agricultural pressure, there are no large wild mammals remaining. Smaller mammals such as the Golden Jackal *Canis aureus* and Black-naped Hare *Lepus nigricollis* are often seen. There are reports of Nilgai *Boselaphus tragocamelus* but this antelope is very common and an agricultural pest in most of the area. As far as we know, no study has been done on reptiles.

LAND USE

- Agriculture
- Fisheries

THREATS AND CONSERVATION ISSUES

- Fisheries
- Drainage
- Disturbance to birds
- Poaching
- Weed infestation
- Use of pesticides
- Insufficient management interventions like monitoring

The Pyagpur Jheel is presently under tremendous biotic pressures such as fishing, weed infestation and drainage for cultivation. The local farmers use the lake water for irrigation. Fishing by country boats brings all types of disturbance and damage to the habitat. This jheel is an important natural resource, primarily for fisheries in Bahraich district. Intensive fishing causes excessive disturbance to the avifauna. Fish is one of the most important and abundant resource and forms the lifeline for rural economy. Furthermore, a large part of the population that lives close to the jheel uses the water for drinking, washing and bathing. The jheel is surrounded by villages from almost all sides. Peripheral agriculture with crops such as paddy, sugarcane, mustard etc. add pressure to the jheel. Extraction of water from the jheel and use of pesticides are two major concerns. A section of locals exclusively use a variety of paddy which is grown inside the water body. Also, virtually the whole of Pyagpur is covered with *Eichhornia crassipes*. A portion on one of the sides of the jheel is used for cremation by the locals. It is an ancient site, built by the erstwhile Raja of Pyagpur.

The Sitadwar jheel is also under huge human pressure with activities such fishing and drainage of water.

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V.P. Singh, K.S. Gopi Sunder, Asad R. Rahmani, Neeraj Srivastav

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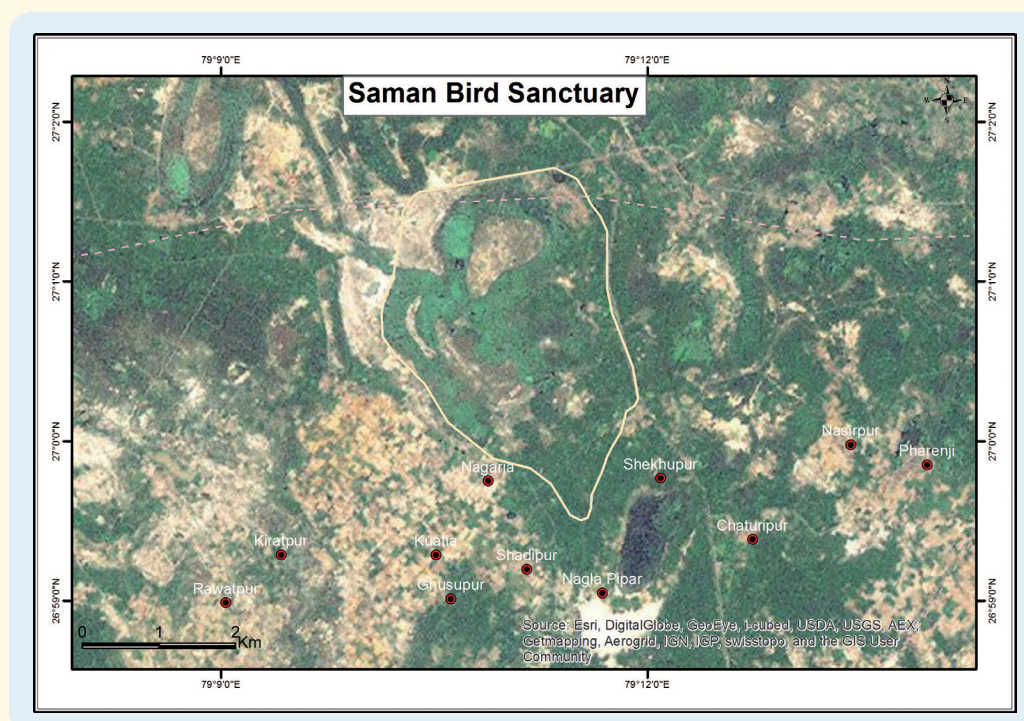
SAMAN BIRD SANCTUARY

IN-UP-16

IBA Site Code	: IN-UP-16	Area	: 525 ha
State	: Uttar Pradesh	Altitude	: 160 msl
District	: Mainpuri	Rainfall	: 880 mm
Coordinates	: 27° 04' 60" N, 79° 00' 00" E	Temperature	: 1 °C to 48 °C
Ownership	: State, Private	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i ($\geq 1\%$ biogeographic population), A4iii (Congregation $\geq 20,000$ waterbirds).

PROTECTION STATUS: Bird Sanctuary, established May, 1990.



GENERAL DESCRIPTION

Saman Bird Sanctuary is located near village Saman in Karhal *tehsil* of Mainpuri district. It was declared as a bird sanctuary in 1990 by a gazette notification. The sanctuary is a natural rainfed oxbow lake of approximately 525 ha, that dries up in summer. The wetland attracts large numbers of migratory birds in winter, while resident bird fauna are seen all year round. The site is important for large wintering waterfowl congregations. There are eight villages inside the sanctuary, and several along the periphery.

Nelumbo is found on the entire waterbody, along with a highly diverse group of hydrophytic vegetation which includes *Cyperus*, *Phragmites*, and *Typha*. There has been no study of the flora in this sanctuary.

About 100 years ago, Saman Jheel, along with Lakh-Bahosi (an IBA) in nearby Farrukhabad district and other jheels, formed an important habitat for the Siberian Crane

Grus leucogeranus. The great ornithologist A.O. Hume saw Siberian Cranes in many jheels in Etawah and Mainpuri districts between 1858 and 1867. Saman could have been one of the important sites, although Hume did not mention it by name. The name “Tuman” (26° 46' N, 79° 02' E) is mentioned in literature, where W.E. Brooks shot three Siberian Cranes in February, 1871. It appears that Tuman is none other than Saman Jheel (Rahmani & Arora 1992).

The Wetland Division of the Ministry of Environment and Forests, Government of India, has identified Saman under the Wetland Conservation Programme. Sálím Ali Centre for Ornithology and Natural History, Coimbatore (SACON) has also recommended this wetland to be declared as a Ramsar Site (Prasad *et al.* 2004). Islam & Rahmani (2008) recommended Saman as a Ramsar Site as it fulfils Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 5 (wetland regularly supports 20,000

or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies).

AVIFAUNA

Saman Jheel is famous for congregations of waterbirds during winter. Three to five breeding pairs of Sarus Crane *Grus antigone* are resident in the sanctuary. In January 2001, waterfowl census revealed more than 1,500 Common Teal *Anas crecca*, 6,000–10,000 Northern Pintail *Anas acuta*, 30,000 Lesser Whistling Duck *Dendrocygna javanica*, and 200 Great White Pelican *Pelecanus onocrotalus* (V.P. Singh, pers. comm. 2003). Many of these species occur in far greater numbers than their 1% biogeographic population threshold determined by Wetlands International (2012), so the site fits A4i criteria also.

A heronry on a large *Ficus* tree has c. 150 nests of Black-crowned Night Heron *Nycticorax nycticorax*, with several nests of egrets *Egretta* spp. and Indian Pond Heron *Ardeola grayii*. A breeding pair of Black-necked Stork *Ephippiorhynchus asiaticus* and one or two Greater Spotted Eagle *Clanga clanga* are regularly found in the sanctuary. The former is considered Near Threatened and latter Vulnerable by BirdLife International (2014).

From 2008 to 2010, wetlands of Uttar Pradesh, including Saman, were monitored during an avian flu surveillance project and waterbird census was conducted (Rahmani et al. 2010). There was higher diversity of anatids in the winter season 2009–2010, compared to the winter season of 2008–2009. The highest number of waterbirds recorded in winter 2009–2010 was 69,303 in the first fortnight count in December, 2009, and in summer the highest number was 171 in the first count of March, 2009, whereas the lowest number of birds was nine in the second fortnight count of June, 2009. The rainfall in 2008 was very low compared to 2009, and more water was brought into the wetlands by a canal in 2009. Water was available for a longer period in 2010, and therefore the abundance and diversity of birds were higher in the winter of 2009–2010. The wetland has high-quality habitats with sufficient shelter and foraging area for waterfowl (Rahmani et al. 2010).

VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
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OTHER KEY FAUNA

Being a wetland and entirely surrounded by anthropogenically modified countryside, there are no large mammals of conservation concern in the area.

LAND USE

- Forest Department
- Private lands
- Village council (*gram panchayat*)
- Agriculture and Water Chestnut cultivation
- Grazing

THREATS AND CONSERVATION ISSUES

- *Eichhornia* infestation
- Acute grazing pressure from livestock
- Illegal bird trapping
- Pesticides from agriculture fields and Water Chestnut cultivation
- Drainage (badly planned development projects)
- Private field within the Sanctuary

The administrative control of the wetland is shared between the Forest Department, private owners, and the village council (*gram panchayat*), which would lead to conflict of interests. The spread of *Prosopis chilensis* around the waterbody is posing a serious problem. Increase in alkalinity of the land and increase in sodic areas are urgent concerns. Grazing and agriculture is intensifying, and the number of cattle and pigs in the sanctuary is very high at any time of the year. Many villages are located inside the sanctuary and often become islands after the rains. Construction of roads and bunds to connect these villages is changing the hydrology of the wetland, and these villages need to be relocated to conserve the area efficiently as a sanctuary.

Rights of the local residents need to be settled on priority to safeguard this sanctuary from further damage.

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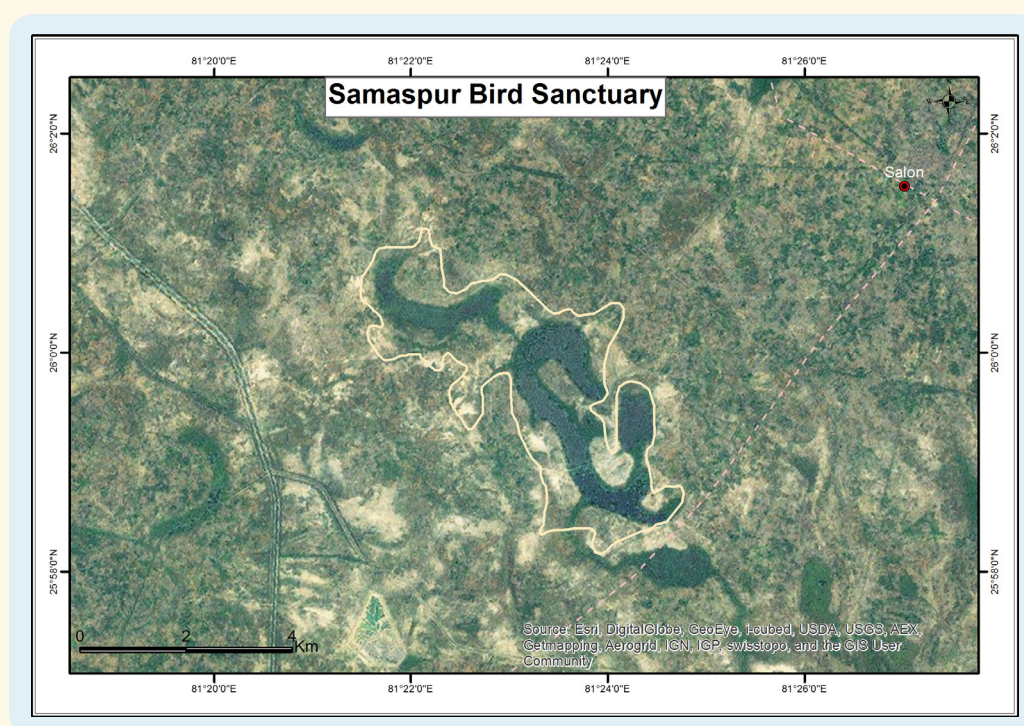
SAMASPUR BIRD SANCTUARY

IN-UP-17

IBA Site Code	: IN-UP-17	Area	: 799 ha
State	: Uttar Pradesh	Altitude	: Not available
District	: Raebareli	Rainfall	: 850 mm
Coordinates	: 26° 00' 00" N, 81° 25' 00" E	Temperature	: 4 °C to 48 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i ($\geq 1\%$ biogeographic population), A4iii (Congregation: $\geq 20,000$ waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established in August 1987.



GENERAL DESCRIPTION

Samaspur Wildlife Sanctuary, with an area of c. 800 ha of perennial wetland, is located in the Salon *tehsil* of Raebareli district. Salon wetland was renamed as Samaspur Bird Sanctuary in 1987. The lake is S shaped, and comprises six small connected lakes: Samaspur, Mamani, Mamani Gram Samaj, Gorwa Hasanpur, Hakganj, and Rohania. The seventh lake, Bissaiya, is close by but not connected with the main waterbody. It also forms a part of the sanctuary.

Samaspur wetlands are perennial and receive water from rainfall (average 850 mm per annum) and from the terminal end of irrigation canals (Rahmani 1992). As they are depressions, water from surrounding areas drains into these jheels. Of the 800 ha declared as Samaspur Bird Sanctuary, only c. 207 ha is under water, the remaining area is dry land where the Forest Department has created

plantations. It also includes 271 ha of private land which has crop fields and orchards. These crops fields, orchards, wastelands (locally called *usar*), and pastures, along with jheels, create a mosaic of habitats that results in high bird species diversity. In one day of birdwatching in December 1987, 112 species were identified (Rahmani 1992).

AVIFAUNA

This IBA hosts more than 110 bird species. Among those recorded were 14 species of ducks, 13 species of waders, four species of storks, and 10 species of raptors. Ducks and waders were seen in thousands. About 80,000 waterfowl were estimated during a visit in 1987 (Rahmani 1992). Many of these species occur in much higher numbers than their 1% biogeographic population threshold, calculated by Wetlands International (2012) on the basis of total biogeographic populations of waterbirds.

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

Based on the ecological, biological, and tourism importance of Samaspur Bird Sanctuary, Islam & Rahmani (2008) suggested that it should be declared as a Ramsar Site, as it fulfils Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies). Samaspur Jheel is also included in the list of Wetlands of National Importance prepared by the MoEF.

A pair each of Black-necked Stork *Ephippiorhynchus asiaticus* and Pallas's Fish-eagle *Haliaeetus leucoryphus* regularly breeds in this sanctuary (Rahmani 1992).

Despite Samaspur being such an important bird refuge of northern India, detailed work has not been conducted on the birdlife of this site.

Before large-scale killing of vultures by the killer drug diclofenac, innumerable number of vultures, mainly White-rumped *Gyps bengalensis* and Long-billed *Gyps indicus*, used to be seen in this area, but now they have almost disappeared. However, the Endangered Egyptian Vulture *Neophron percnopterus* is still seen in and around nearby villages on garbage dumps.

OTHER KEY FAUNA

More than 10 fish species of economic importance are reported from Samaspur Bird Sanctuary (Rahmani 1992). As agricultural fields and villages surround the area, no large wild mammal presently of conservation concern is found here. Nilgai and Golden Jackal *Canis aureus* are very common in the area.

LAND USE

- Nature conservation and research
- Agriculture

THREATS AND CONSERVATION ISSUES

- Fishing
- Drainage
- Livestock grazing
- Siltation
- Pesticides

Due to cultivation in the adjacent areas, run-off from the fields enters the lakes and results in eutrophication. Another problem is the spread of *Eichhornia crassipes*, which is fast invading the waterbody, restricting the free movement of waterfowl. Non-linkage of Bissaiya Lake with other wetlands is one of the hurdles in implementing management options, since the continuity of the site disrupted.

Illegal fishing by the inhabitants of surrounding villages has also been reported. Livestock grazing in the surrounding land causes soil erosion, which enhances siltation of the jheel.

Within the 10 km buffer zone that every sanctuary is supposed to have, is located the 1,050 MW Feroz Gandhi Unchahar Coal Based Thermal Power Plant of NTPC Ltd. There is a plan to expand this plant by additional generation of 500 MW (Stage-IV). Stage-I (420 MW), Stage-II (420 MW), and Stage-III (210 MW) are already in operation. Samaspur Bird Sanctuary is located 7.9 km from the project boundary. Though the expansion will be carried out within existing plant premises, additional land of 200 acres will be required for ash disposal. Water will be obtained from Sharda Sahayak Link Canal. Coal required will be 2.7 million tons per annum. Altogether, the environmental impact of expansion will be detrimental to the sanctuary.

KEY CONTRIBUTOR

Asad R. Rahmani

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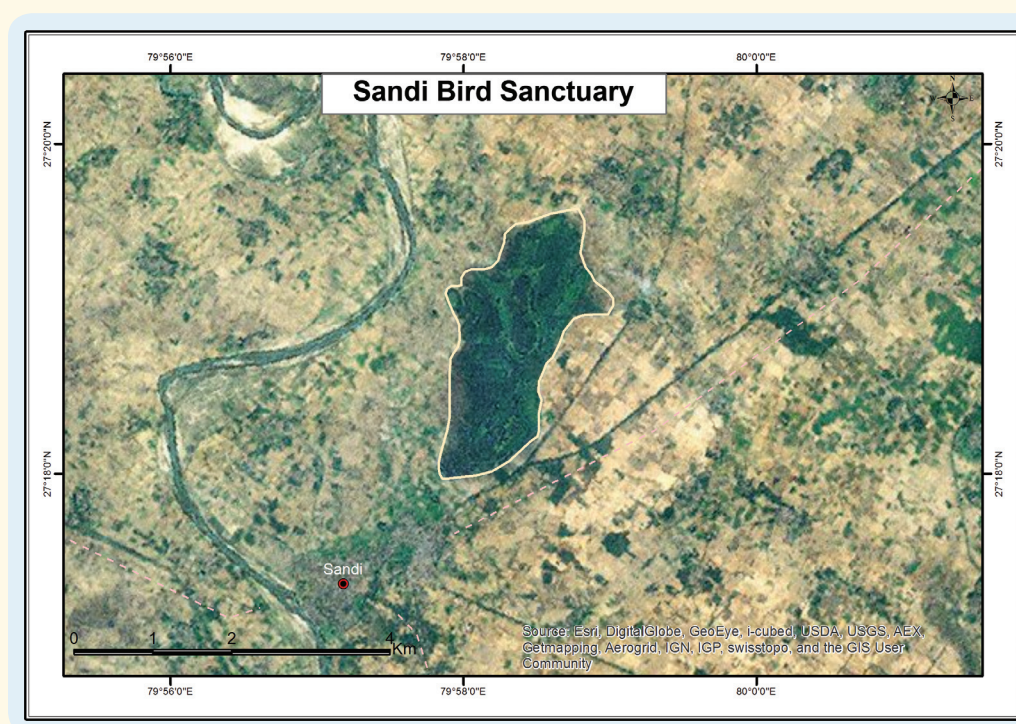
SANDI BIRD SANCTUARY

IN-UP-18

IBA Site Code	: IN-UP-18	Area	: 309 ha
State	: Uttar Pradesh	Altitude	: Not available
District	: Hardoi	Rainfall	: Not available
Coordinates	: 27° 15' 60" N, 79° 55' 00" E	Temperature	: 4 °C to 40 °C
Ownership	: State, Private	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i ($\geq 1\%$ biogeographic population), A4iii (Congregation: $\geq 20,000$ waterbirds).

PROTECTION STATUS: Bird Sanctuary, established in May 1990.



GENERAL DESCRIPTION

Sandi was declared as a Bird Sanctuary in 1990, with the sole purpose to restore this important waterfowl habitat. The sanctuary, with an area of 309 ha, is located in Bilgram *tehsil* of Hardoi district. The sanctuary is formed by both private land and *gram samaj* (revenue) land. It was listed as an IBA on account of the presence of the globally Threatened Sarus Crane *Grus antigone*.

As far as we know, no scientific study on the flora of Sandi Bird Sanctuary has been conducted. Like all other tropical seasonal wetlands of the Gangetic plain, the aquatic plant life is very rich in submerged, floating, and emergent vegetation. Thick stands of *Typha* on the fringes of Sandi Jheel, also known by its old name Dahar Jheel, provide good breeding habitat for resident waterbirds.

Sandi Jheel is a potential candidate to become a Ramsar Site as it fulfills the following Ramsar Criteria: Criteria

2 (wetland supports threatened ecological communities), Criteria 4 (wetland provides refuge during adverse conditions to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies) (Islam & Rahmani 2008). It has also been selected by the MoEF is one of the important wetlands of India.

AVIFAUNA

This IBA is home to a resident flock of around 200 Sarus Crane (K.S.G. Sundar, *pers. comm.* 2003). It receives thousands of waterfowl in winter, primarily Greylag Goose *Anser anser*, Northern Pintail *Anas acuta*, Northern Shoveller *A. clypeata*, Gadwall *A. strepera*, Northern Shoveller *A. clypeata*, Brahminy Duck *Tadorna ferruginea*, Red-crested Pochard *Netta rufina*, and Cotton Teal or



DHRITIMAN MUKHERJEE

Sandi jheel was once famous for hunting of waterfowl and during the last 100 years there have been many interesting confirmed records of species such as Marbled Teal *Marmaronetta angustirostris*. Now it is totally protected by the UP Forest Department and has become a paradise for migratory and resident species such as Indian Spot-billed Duck *Anas poicilorhynchus* which breeds in Sandi during monsoon

Pygmy-goose *Nettapus coromandelianus*. Some resident waterbirds include Bronze-winged Jacana *Metopidius indicus*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, Asian Openbill *Anastomus oscitans*, Painted Stork *Mycteria leucocephala*, and Black-necked Stork *Ephippiorhynchus asiaticus*.

This sanctuary has been designated as an IBA on the basis of the presence of up to 200 globally Threatened Sarus in summer, (BirdLife International 2001). As very large

numbers of waterfowl are seen, the site would also qualify for A4i criteria (presence of $\geq 1\%$ biogeographic population).

OTHER KEY FAUNA

This wetland is entirely surrounded by man-modified habitat (agriculture), so most wild large mammals have already disappeared. Except for Nilgai *Boselaphus tragocamelus*, which is a crop pest, there is no large ungulate in the area.

ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>
VULNERABLE	
Pallas's Fish Eagle (?)	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

LAND USE

- Nature conservation and research
- Agriculture

THREATS AND CONSERVATION ISSUES

- Poaching
- Grazing
- Fishing
- Encroachment

Extensive use of water for irrigation, encroachment, and agriculture may result in the conversion of the jheel area into agricultural land in the coming years. Villagers regularly collect vegetation from the wetlands, and also graze their cattle. On a small scale, these activities are not detrimental to the maintenance of the tropical wetland, but they have to



DHIRTIMAN MUKHERJEE

More than 20,000 waterfowl are found in Sandi including hundreds of Greylag Goose *Anser anser*



ASAD R. RAHMANI

Sandi Bird Sanctuary has good infrastructure and easy accessibility for birdwatchers

be regulated for the long-term survival of this IBA.

During the last 10 years, the Forest Department has taken many good conservation measures which have resulted in very good protection. Now a large number of tourists visit the sanctuary. Boating should be strictly banned as it disturbs

birds. Not even high officials on their so-called inspection tours should be allowed boating. The boats should be strictly used only for management and vigilance purposes.

Local villagers should be involved in development of a management plan so that they get direct benefits in the form of grass and water, while waterfowl are not disturbed. Once the villagers see the benefits of conserving this waterbody, poaching will also be controlled.

Long-term bird monitoring should be started in this IBA, involving experts and local people. Local people should be trained as bird guides so that they get employment.

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V. P. Singh, K.S. G. Sundar

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SARSAI NAWAR LAKE

IN-UP-19

IBA Site Code : IN-UP-19

State : Uttar Pradesh

District : Etawah

Coordinates : 26° 58' 19" N, 79° 15' 17" E

Ownership : Village Council, Private

Area : c. 690 ha

Altitude : 160 msl Rainfall: 880 mm

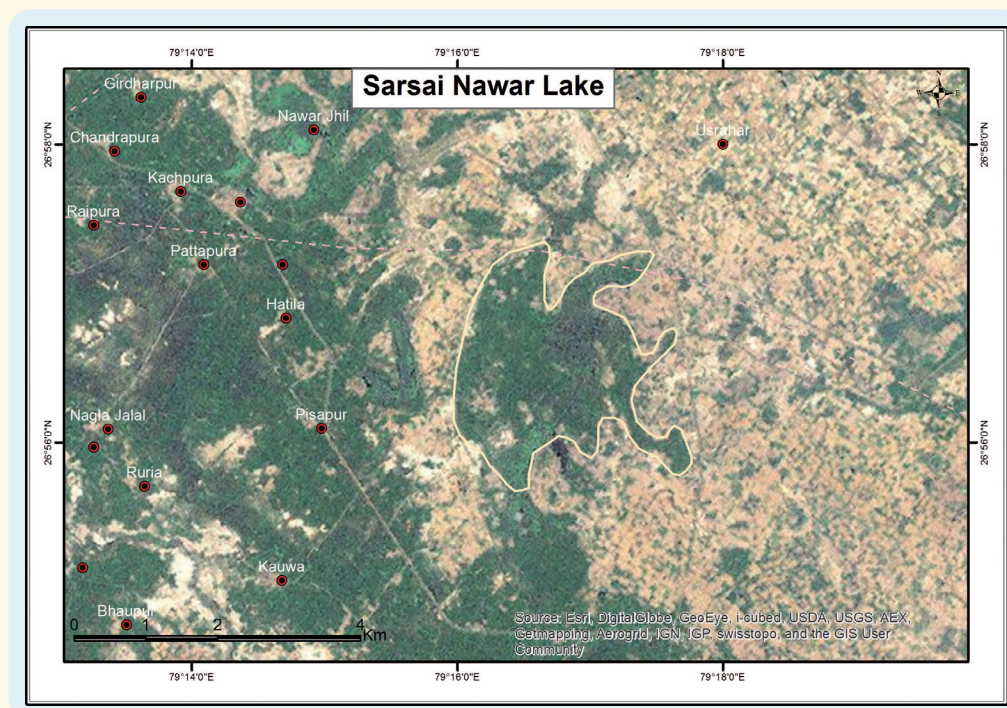
Temperature : 1 °C to 48 °C

Biogeographic Zone : Gangetic Plain

Habitats : Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i ($\geq 1\%$ biogeographic population), A4iii (Congregation $\geq 20,000$ waterbirds)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Sarsai Nawar Lake is a natural depression that fills up during the monsoon. A very old Shiva temple adjoins the lake and is visited by thousands of pilgrims each year, particularly during the Shivaratri festival in the first week of March. The lake is important because it is the roosting area of the largest flock of Sarus Crane *Grus antigone* in the region, consisting of nearly 400 individuals. The name of the lake is derived from the Sarus (*Sarsai* = Sarus, *Nawar* = shallow wetland: Wetland for Sarus). In addition to Sarus, a vast number of waders, ducks, and geese visit the lake in winter. Three resident species of storks, namely the Painted *Mycteria leucocephala*, Asian Woollyneck *Ciconia episcopus*, and Black-necked Stork *Ephippiorhynchus asiaticus* feed in the lake throughout the year.

The wetland is unusual in that the principal vegetation is Common Nut Sedge *Cyperus rotundus*, and there is no emergent vegetation. Other vegetation includes several species of grasses.

The Wetland Division of the Ministry of Environment and Forests, Government of India, has identified Saman under the Wetland Conservation Programme. The Salim Ali Centre for Ornithology and Natural History, Coimbatore, has also recommended this wetland to be declared as a Ramsar Site (Prasad *et al.* 2004). Islam and Rahmani (2008) have recommended Sarsai Nawar Lake as a Ramsar Site as it fulfills Ramsar Criteria 2 (Wetland supports threatened ecological communities), Criteria 5 (wetland regularly supports 20,000 or more waterbirds) and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies). However, looking at the present condition of the lake, it will need urgent protective measures to fulfill these criteria.

AVIFAUNA

The site has been selected as an IBA on the basis of congregations of Sarus and waterfowl. In addition, eight breeding pairs of Sarus have made parts of this lake their

territory. Between 1999 and 2002, these pairs raised 23 young, making this the most productive wetland known for Sarus Crane (K.S. Gopi Sundar, *pers. comm.* 2003). Two pairs of Black-necked Stork have adopted portions of the lake as part of their territory and raise young nearly every year. The wetland and surrounding trees used to have a resident population of more than 150 White-rumped Vulture *Gyps bengalensis* until 2000, when a drastic population decline was noted.

Each year, a minimum of 6,000 ducks and geese, and 12,000 waders winter in the lake, the principal species being Wigeon *Mareca (=Anas) penelope*, Northern Pintail *Anas acuta*, Greylag Goose *Anser anser*, and Common Greenshank *Tringa nebularia*. Small numbers (<10) of Eurasian Crane *Grus grus* winter in the lake for a month or so each year in the early 2000s.

It appears that the wetland has deteriorated during the last ten years mainly due to encroachment of habitat. From 2008 to 2010, Sarsai Nawar Lake, along with other wetlands of the state, was monitored for avian flu surveillance (Rahmani *et al.* 2010). During the winter of 2008–2009, the maximum number of waterbirds (593) was recorded in the first fortnight count of January, 2009. In summer 2009, the maximum number of waterbirds (232) was recorded in April (second count), and the minimum (87) in March (second fortnight count). The summer population count included species such as egrets, herons, and Sarus Crane. In winter 2009–2010, the maximum number of waterbirds (851) was recorded in the first count of February, 2010 and the minimum (328) in November, 2009. Four species of storks, namely Painted *Mycteria leucocephala*, Asian Openbill *Anastomus oscitans*, Asian Woollyneck *Ciconia episcopus*, and Black-necked Stork *Ephippiorhynchus asiaticus* were also recorded at the lake.

A total of 37 species of waterbirds was recorded during the study period (Rahmani *et al.* 2010). The lake is mainly known as a roosting site of Sarus Crane and waterfowl, which assemble in the late evening in this wetland. Northern Shoveller *Anas clypeata*, Gadwall *Mareca (=Anas) strepera*, and Lesser Whistling Duck *Dendrocygna javanica* were the common waterfowl found in the lake during 2008–2009.

A maximum of 115 individuals of Sarus Crane was recorded here in January, 2010 and a minimum of eight individuals in March, 2009. The maximum count of Black-necked Stork was five individuals in the lake in January, 2010 (Rahmani *et al.* 2010).

OTHER KEY FAUNA

The lake has a good population of Flap-shell Turtle *Lissemys punctata*, and many families of the Common

VULNERABLE

Sarus Crane	<i>Grus antigone</i>
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NEAR THREATENED

Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>

Mongoose *Herpestes javanicus* live immediately around the lake.

LAND USE

- Agriculture

THREATS AND CONSERVATION ISSUES

- Cultivation of Water Chestnut
- Irrigation
- Agricultural expansion on the lake edges

This IBA site is under severe threat due to human pressure. Water from the lake is routinely pumped out to neighbouring crop fields. This renders the waterbody dry for three to four months each year. Immediately after the monsoon, while breeding of most of the resident waterbirds is in progress, cultivation of Water Chestnut *Trapa natans* in most of the lake results in the deterioration of bird habitats. Due to intensification of this cultivation, though it is illegal since 2000, very little area remains available to wintering waterbirds. In 2001, counts of ducks were below 500 and waders barely exceeded a thousand individuals. Of the eight nests of Sarus Crane known in the lake, three failed in 2001 due to disturbance caused by people cultivating Water Chestnut. Large quantities of pesticides are also used. This important Sarus nesting area needs immediate protection.

KEY CONTRIBUTORS

K.S. Gopi Sundar, IBA Team

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SAUJ LAKE

IN-UP-20

IBA Site Code : IN-UP-20

State : Uttar Pradesh

District : Mainpuri

Coordinates : 26° 01' 00" N,
79° 55' 17" E

Ownership : Gram Panchayat (village council)

Area : 400 ha

Altitude : 140 msl

Rainfall : 880 mm

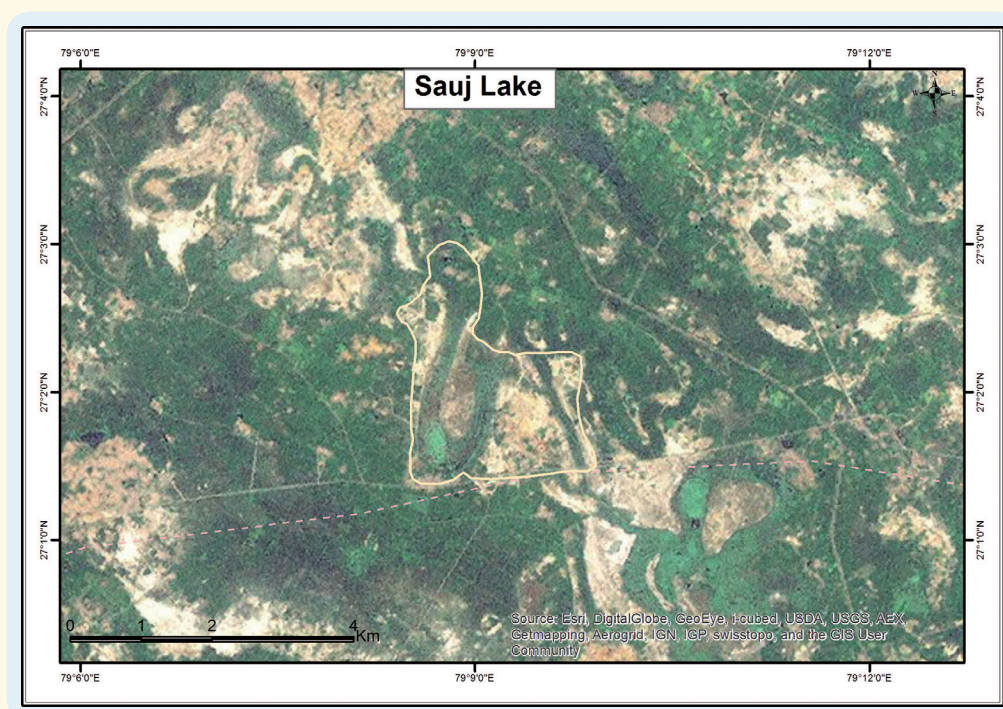
Temperature : 1 °C to 50 °C

Biogeographic Zone : Gangetic Plain

Habitats : Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i ($\geq 1\%$ biogeographic population), A4iii (Congregation $\geq 20,000$ waterbirds)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Sauj Lake lies beside the Karhal-Kishni main road, close to the town of Saman, just before Saman Bird Sanctuary. The lake is a shallow depression in the landscape. A culvert on the road near Sauj village is an ideal vantage point from which one can view the entire lake. A canal on the northern side of the lake brings in agricultural runoff, and another to the south takes away excess water to Saman Bird Sanctuary. Agriculture is restricted to two sides of the lake, the third side is bordered by Sauj village, and the fourth is a flooded grassy meadow which provides habitat for a range of waterbirds throughout the year. This lake has been under observation for over a century now, though not on a regular basis. References to it can be found in Sauvey *et al* (1987), it has been detailed by Scott (1990) as an important wetland area, and also briefly mentioned by Rahmani (1989), giving the number of Black-necked Storks *Ephippiorhynchus*

asiaticus sighted. The green-brown colour on the surface of the lake changes when light pink lotuses bloom immediately after the monsoon.

The water of the lake is almost completely covered by *Nelumbo* sp., and bordered with *Saccharum* on one side, and with a few scattered clumps of *Ipomoea carnea*.

AVIFAUNA

Sauj is an excellent waterbody of western Uttar Pradesh, where more than 20,000 waterbirds are regularly seen. A very large flock of 2,500 Great White Pelican *Pelecanus onocrotalus* was counted between December 1999 and February 2000 on this relatively small lake (K.S. Gopi Sundar, *pers. comm.* 2003). According to Wetlands International (2012), 1% non-breeding South Asian population threshold of this species is only 210. Therefore, sighting of such a large number in such a small waterbody is of great significance.

The largest flock of Sarus Crane *Grus antigone* seen at Sauj during 1999–2002 numbered 210 birds, and flocks exceeding 150 individuals are common throughout the year in summer and in winter. At least three territorial breeding pairs of Sarus have made the lake their permanent home, and chicks are seen regularly (K.S. Gopi Sundar, *pers. comm.* 2003). Two pairs of Black-necked Stork *Ephippiorhynchus asiaticus* can be seen foraging regularly in the lake. Flocks of Painted Stork *Mycteria leucocephala* number over 100 individuals, as do Asian Openbill *Anastomus oscitans* and Black-headed Ibis *Threskiornis melanocephalus*. Greater Spotted Eagle *Clanga clanga* and Western Marsh Harrier *Circus aeruginosus* are also found in the area (Rahmani *et al.* 2010).

Between 2008 and 2010, avian flu surveillance was done, during which many wetlands, including Sauj Lake, were monitored every fortnight for waterbirds (Rahmani *et al.* 2010). During the study period, 37 species of waterbirds were recorded at Sauj Lake. Among ducks, the Northern Shoveller *Anas clypeata* Gadwall *Anas strepera*, Lesser Whistling Duck *Dendrocygna javanica*, and Garganey *Anas querquedula* were common. In the winter of 2008–2009, the maximum number of waterbirds (1,118) was recorded in the first count of January, 2009. In the summer of 2009, the maximum number (613) in the first count of March, while the minimum number (85) was recorded in the first count of May. In winter 2009–2010, the maximum and minimum number of 1,315 and 208 individuals was recorded in the second counts carried out in November and December, 2009, respectively. Four species of storks, namely Painted Stork, Asian Openbill, Asian Woollyneck *Ciconia episcopus*, and Black-necked Stork were recorded in the lake. Sarus Crane was recorded throughout the study period at Sauj (Rahmani *et al.* 2010).

VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Sarus Crane	<i>Grus antigone</i>
Greater Spotted Eagle	<i>Clanga clanga</i>

NEAR THREATENED

Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>

OTHER KEY FAUNA

Owing to the proximity of Sauj village, agricultural fields, and a main road, wild mammals are rare to find in and

around Sauj Lake. Flap-shell Turtle *Lissemys punctata* is very common in the lake, and many individuals can be seen on the road in the monsoon.

LAND USE

- Nature conservation
- Agriculture

THREATS AND CONSERVATION ISSUES

- Cultivation
- Agricultural expansion on the lake edges

Though Sauj village is on the edge of the lake, there is presently very little pollution by sewage in the lake. However, there is the risk of eutrophication due to increased agricultural activity around the lake, and overuse by villagers for grazing pigs and livestock. Hunting is very rare and was observed only once between December, 1999 and June, 2002. Water Chestnut is not cultivated, and this is probably the most important reason for the good condition of the waterbody. There is very little pressure on the lake presently and little reason for concern. However, the situation needs to be maintained for the lake to be of continued use to cranes and other waterfowl.

KEY CONTRIBUTOR

K.S. Gopi Sundar

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SHEIKHA JHEEL

IN-UP-21

IBA Site Code : IN-UP-21

State : Uttar Pradesh

District : Aligarh

Coordinates : 27° 49' 00" N, 78° 10' 00" E

Ownership : Gram Panchayat (village council),
Revenue Department

Area : 250 ha

Altitude : Not available

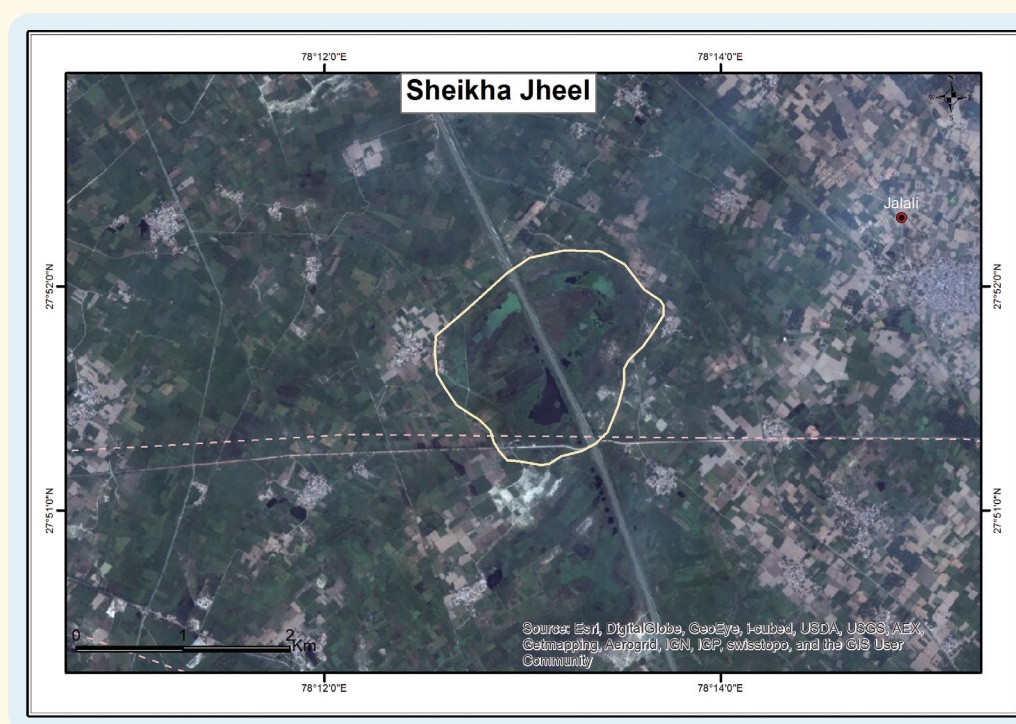
Rainfall : <1,000 mm

Temperature : 4 °C to 40 °C

Biogeographic Zone : Gangetic Plain

Habitats : Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i (≥1% biogeographic population), A4iii (Congregation: ≥ 20,000 waterbirds)

PROTECTION STATUS: Officially not protected.


GENERAL DESCRIPTION

In Aligarh district, there are a number of wetlands such as Sheikha Jheel (Lake), Rati-ka-Nagla (now in Mahamaya Nagar), Ash Dump Yard, and Aama Khera which are good for waterfowl. Among these, Sheikha Jheel has been developed as a bird sanctuary.

This jheel is located 17 km from Aligarh on the Aligarh-Jalali road near Sheikha and Bhawan-Khera. Jalali village is c. 3 km away, while Sheikha village is less than 1 km. The jheel was divided into three parts, when the Lower Ganga Canal was constructed.

Sheikha Jheel is a typical monsoonal wetland of the Gangetic plain. It gets most of its water from rainfall, but seepage of water from the adjoining canal has made it perennial. Before the canal was constructed, this jheel probably dried up during summer like other similar wetlands.

Sheikha Jheel is surrounded on three sides by natural vegetation. The submerged vegetation consists of *Hydrilla verticillata*, *Ceratophyllum demersum*, *Vallisneria spiralis*, *Potamogeton crispus*, and *Najas*. Free-floating vegetation consists of *Salvinia* and *Azolla*, and in some places, *Eichhornia crassipes*. Rooted-floating vegetation includes *Nymphoides cristata* and *N. indica*. Islam & Rahmani (2008) have recommended Patna Jheel as a Ramsar Site as it fulfills Ramsar Criteria 2 (wetland supports threatened ecological communities), Criteria 4 (wetland provides refuge during adverse condition to threatened species), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies). The Wetland Division of the Ministry of Environment, Forests, and Climate Change (MoEFCC), Government of India, has identified Sheikha Jheel under the Wetland Conservation Programme.

AVIFAUNA

Around 166 species of birds are reported from Sheikha and its environs (Rahmani & Sharma 1997). This wetland harbours more than 10,000 birds during the winter months.

While $\geq 20,000$ waterbirds may not be found in Sheikha Jheel at a time, more than 20,000 waterbirds use this wetland throughout the year, because large migratory flocks of waders are seen in March-April. Thus, the site would qualify for A4ii criteria. Many waders and ducks are also present in thousands, easily exceeding their 1% biogeographic population threshold, as determined by Wetlands International (2012).

About 100–200 Sarus Crane *Grus antigone* congregate in this small wetland, mostly in the dry months. According to Wetlands International (2012), 1% threshold of Sarus is 90. Choudhury *et al.* (1999) have also found Sheikha Jheel and its environs extremely important for the conservation of Sarus Crane. During their surveys, they found 30 adults and 10 juveniles.

Till the mid 1990s, Gyps vultures were extremely common, with many nests of White-rumped Vulture *Gyps bengalensis* on large trees. Along with the Long-billed *Gyps indicus* and Egyptian Vulture *Neophron percnopterus*, it was seen on carcasses. But, now only Egyptian Vulture is seen occasionally sauntering on garbage dumps near villages.

Sighting of Near Threatened Black-necked Stork *Ephippiorhynchus asiaticus*, sometimes with juveniles, is

not uncommon in Sheikha Jheel. Nests of Grey Heron *Ardea purpurea*, Little Cormorant *Phalacrocorax niger*, Little Egret *Egretta garzetta*, Cattle Egret *Bubulcus ibis*, and other species are found on the large *Ficus* and *Dalbergia* trees.

A pilot bird ringing project was initiated in 1988 and several birds with Russian rings were recaptured (S.H.A. Yahya, *pers. comm.* 2001).

From 2008 to 2010, Sheikha Jheel, along with some wetlands of Uttar Pradesh, were monitored every fortnight for avian flu surveillance, and many birds were caught to take samples and for banding (Rahmani *et al.* 2010). Family Anatidae indicated an increasing trend in its population in winter 2009–2010, as compared to winter 2008–2009. The total population of waterbirds was significantly lower during summer and monsoon. By the end of February some species such as Greylag Goose *Anser anser*, Northern Pintail *Anas acuta*, Northern Shoveller *A. clypeata*, and Gadwall *A. strepera* started returning to their breeding grounds and in summer and monsoon, only resident birds such as the Spot-billed Duck *Anas poecilorhyncha*, Comb Duck *Sarkidiornis melanotos*, and Lesser Whistling Duck *Dendrocygna javanica* were left behind to breed. Common Shelduck *Tadorna tadorna* was occasionally sighted.

The Phalacrocoracid population (cormorants) was found to be high during winter 2008–2009, which decreased to low numbers in summer 2009. Rallidae populations (moorhens and coots) also varied across seasons during the study period and increasing trends were recorded for this family in the two-year study (Rahmani *et al.* 2010).

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Indian Vulture	<i>Gyps indicus</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Lesser Flamingo	<i>Phoeniconaias minor</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Pallid Harrier	<i>Circus macrourus</i>
Red-headed Falcon	<i>Falco chicquera</i>
Great Thick-knee	<i>Esacus revurvirostris</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Eurasian Curlew	<i>Numenius arquata</i>
Black-tailed Godwit	<i>Limosa limosa</i>
River Tern	<i>Sterna aurantia</i>

OTHER KEY FAUNA

As Sheikha Jheel is surrounded by agricultural fields and villages, no large wild mammal of conservation concern is found in the area. Only Bluebull or Nilgai *Boselaphus tragocamelus*, which is considered sacred by many people, is found. Occasionally, Blackbuck *Antelope cervicapra* is seen in the drier area on the further side of Aligarh-Jalali road.

LAND USE

- Agriculture

THREATS AND CONSERVATION ISSUES

- Groundwater abstraction
- Siltation
- Eutrophication

Till the mid 1970s, Sheikha Jheel was the main shooting ground of local hunters, but due to an intensive campaign by the Nature Conservation Society of Aligarh, hunting was controlled. The Uttar Pradesh Forest Department placed a guard for some years, which greatly helped in preventing poaching. At the same time, villagers were also convinced of the importance of this jheel and now they help to prevent poaching. Being so close to a large university



DHIRTIMAN MUKHERJEE

Sheikha Jheel is becoming very popular. No attempt should be made to change the naturalness of the Jheel

and town, Sheikhha Jheel could easily become a good place for birdwatching and environmental education. A proper management plan needs to be developed and implemented, so that the jheel can attract more visitors and more birds.

During the last 30 years of monitoring, there has been no major change in the waterspread, but there is some cultivation around the jheel. Constant vigil is necessary to see that it does not spread closer to the jheel.

During the BNHS project on the Migratory Movement of Waterbirds for Avian Diseases Surveillance, a total of 1,244 birds of 75 species were ringed in the winter of 2009–2010 from Sheikhha Jheel.

On two occasions, while monitoring waterbirds for avian diseases during 2008–2009, poaching of birds by poisoning was found. On enquiring further about bird poisoning in the area, residents informed that occasionally people poison waterbirds for consumption by using phorate, a pesticide used to kill insects, mites, and nematodes. The villagers were informed about the consequences of consuming poisoned birds. The forest guard posted at the jheel should make visits in the surrounding agricultural fields randomly, that may serve as a deterrent to poisoning of waterbirds.

Sheikha Jheel is now very well protected by the Forest Department with guards. It has also become very popular among the people of surrounding villages and Aligarh

town. Visitors, including school children come to the IBA very often.

KEY CONTRIBUTORS

Asad R. Rahmani, Salim Javed, H.S.A. Yahya, K.S. Gopi Sundar, Satish Kumar.

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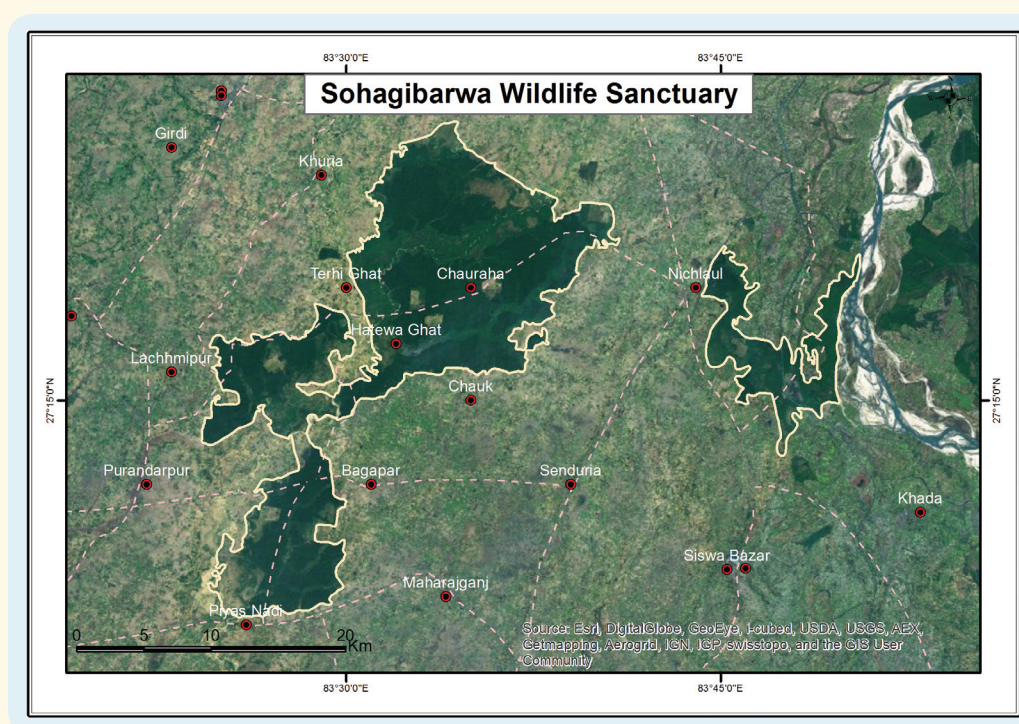
SOHAGIBARWA WILDLIFE SANCTUARY

IN-UP-22

IBA Site Code	: IN-UP-22	Altitude	: 95–103 msl
State	: Uttar Pradesh	Rainfall	: >1,500 mm
District	: Maharajganj, Kushinagar	Temperature	: 4 °C to 40 °C
Coordinates	: 26° 58' to 27° 25' N, 83° 23' to 84° 10' E	Biogeographic Zone	: Gangetic Plain
Ownership	: State	Habitats	: Tropical Moist Deciduous Forest, Freshwater Swamp
Area	: 42,820 ha		

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Wildlife Sanctuary, established in June 1987.



GENERAL DESCRIPTION

Sohagibarwa Wildlife Sanctuary lies in Maharajganj and Kushinagar districts of Uttar Pradesh. The total area of the sanctuary is 42,820 ha. This area has been listed as a Priority III grassland (Matholia, Nichlaul) considering the conservation requirements of the typical fauna of the Terai region (Rahmani & Islam 2000). The sanctuary is divided into seven zones for conservation and management of the flora and fauna.

Sohagibarwa Wildlife Division was earlier part of Gorakhpur Forest Division. In 1964, the Gorakhpur Forest Division was divided into North Gorakhpur and South Gorakhpur. Until 1987, Sohagibarwa Wildlife Sanctuary was managed by the North Gorakhpur Territorial Forest Division.

The importance of this sanctuary is enhanced by the presence of Singhrana Taal, a waterbody in Chowk Range.

Rahmani (1988) had reported thousands of waterbirds but now this wetland is almost totally covered by vegetation.

AVIFAUNA

The Sarus Protection Committee and UP Forest Department have funded a major BNHS project to study the avifauna of Sohagabarwa Wildlife Sanctuary in 2013–2014. According to the study, nearly 200 bird species, including four Threatened and seven Near Threatened species are found. Although tree cover in most of the blocks is fairly good, the undershrub and grasses are greatly disturbed due to biotic pressures. Ground-nesting and middle-level canopy birds are severely disturbed. Similarly, heavy grazing and grass collection has severely impacted the grasslands.

Rahmani *et al.* (1990), during their surveys in the mid 1980s, found that grassland in Compartment No. 16 of Nagwa and Compartment No. 31 of Sunari blocks are still

good florican habitat. These adjoining blocks constitute about 260 ha. During the last 25 odd years, these grasslands have been either planted and now with forest cover or severely overused. During surveys in 2014 by BNHS staff, no potential habitat of the Bengal Florican was found.

Rahmani (1988) counted 45–50 Sarus *Grus antigone* in May 1988 in Singhrana Taal. The cranes may have congregated in this wetland, located deep inside the forest, because most of the smaller wetlands had dried up due to summer heat. A pair of Black-necked Stork *Ephippiorhynchus asiaticus* was also seen, along with a juvenile. During winter, Singhrana Taal attracts hundreds of ducks and geese. Recent surveys by BNHS, from November 2013 to December 2014, estimate a population of 60–65 Sarus in and around the sanctuary. In Ganeshpur in February 2014, 42 were counted. Similarly, 25–30 Lesser Adjutant *Leptoptilos javanicus* were seen in and around this village which is at the edge of the sanctuary. These storks, however, roost and breed(?) in Singhrana Taal. Presence of juveniles of Black-necked Stork proves that this bird still breeds in the area. Sadly, no *Gyps* species of vulture was found by the BNHS team during their study (Rahmani *et al.* 2014, Rahmani *et al.* 2015).

OTHER KEY FAUNA

Sohagibarwa was declared a wildlife sanctuary to protect the large mammalian fauna of the *terai* and *bhabhar* forest types of Uttar Pradesh, such as Tiger *Panthera tigris* and Leopard *Panthera pardus*, and their prey, Cheetal *Axis axis*, Sambar *Cervus unicolor*, Hog Deer *Axis porcinus*, and

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Asian Woollyneck	<i>Ciconia episcopus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>
Lesser Adjutant	<i>Leptoptilos javanicus</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>

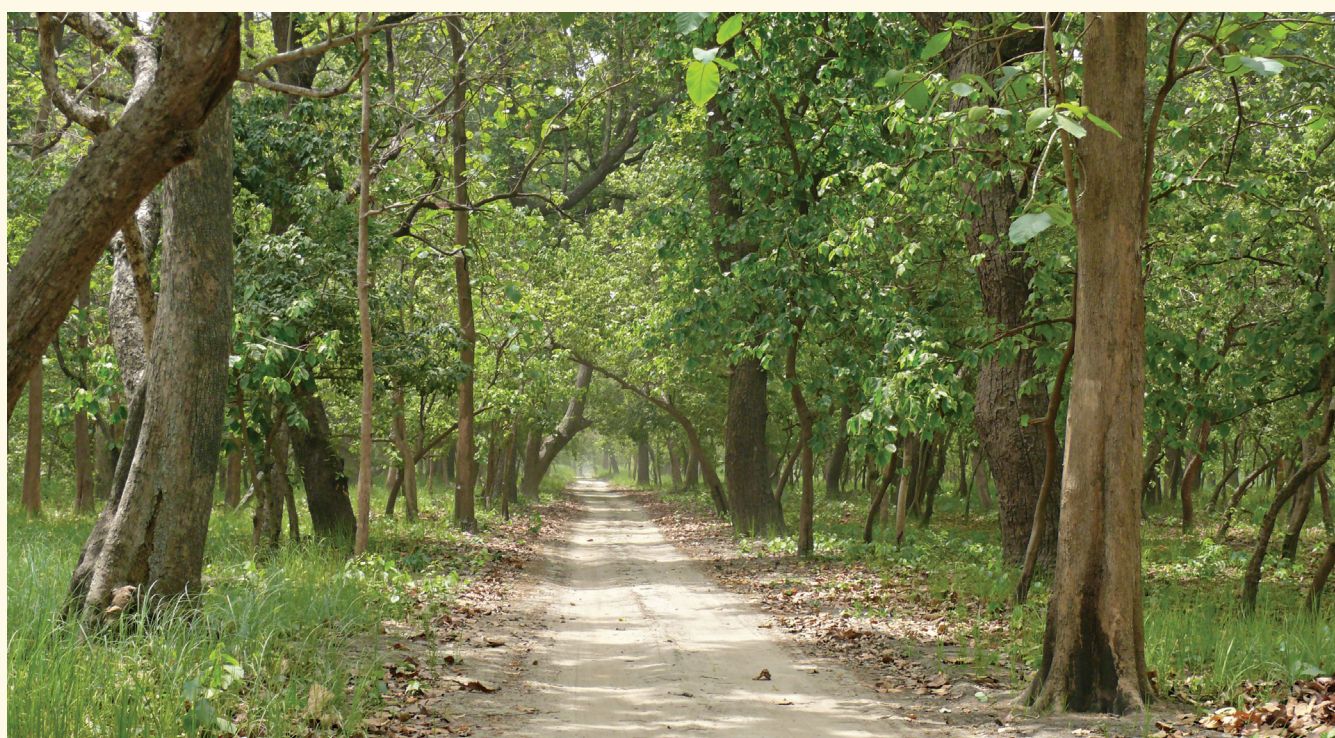
Barking Deer *Muntiacus muntjak*. Despite fragmentation and encroachment of forest corridors, Sohagibarwa WLS is tenuously connected with the much larger Valmiki Tiger Reserve in Bihar, and Royal Chitwan National Park in Nepal, so there could be some movement of animals.

LAND USE

- Nature conservation and research
- Forestry

THREATS AND CONSERVATION ISSUES

- Plantation of grasslands
- Grazing
- Poaching
- Spread of Water Hyacinth in wetlands
- Control on illegal fishing in wetlands



Sohagi Barwa Wildlife Sanctuary is in isolated patches but some of them have very good Sal *Shorea robusta* and mixed forest. As it is surrounded by dense human population, the whole Sanctuary is under tremendous human pressure



RAJAT BHARGAVA

Large number of vultures, mainly Griffon Vulture *Gyps fulvus* and Himalayan Griffon *G. himalayana*, along with few White-rumped *G. bengalensis* are seen in and outside Sohagi Barwa

The major issue for management of the sanctuary is long term conservation of the Tiger, which is the flagship species of the area. Extensive cutting of wood throughout the year is the main disturbance to all wildlife. This needs to be urgently stopped. Collection of Cane *Calamus* sp. is a major threat to mixed forest birds. Singhrana Taal, which is the main waterbody of the sanctuary, is now overrun by *Barringtonia actangula*. To revive Singhrana Taal, *Barringtonia* has to be systematically uprooted from in and around this waterbody. This recommendation should immediately be incorporated in the existing management plan/practices of the sanctuary.

Immediate attention should also be given to control Water Hyacinth in Singhrana Taal and other waterbodies.

Major management concerns of the area include illicit felling, grazing, and increasing pressure from the *taungya* cultivators living in the area. Grazing and afforestation are the primary threats to these Priority III grasslands. Therefore, programmes for fodder management and stopping of all afforestation are important grassland management strategies required here (Rahmani & Islam 2000).

KEY CONTRIBUTORS

Asad R. Rahmani, Zafar-ul Islam, Rajat Bhargava

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SOHELDEV WILDLIFE SANCTUARY

IBA Site Code : IN-UP-23

State : Uttar Pradesh

District : Balrampur, Sharavasti

Coordinates : 27° 44' 18" N,
82° 09' 25" E

Ownership : State

Area : 42,247 ha

Altitude : 120–202 msl

Rainfall : 1,300 mm

Temperature : 4 °C to 40 °C

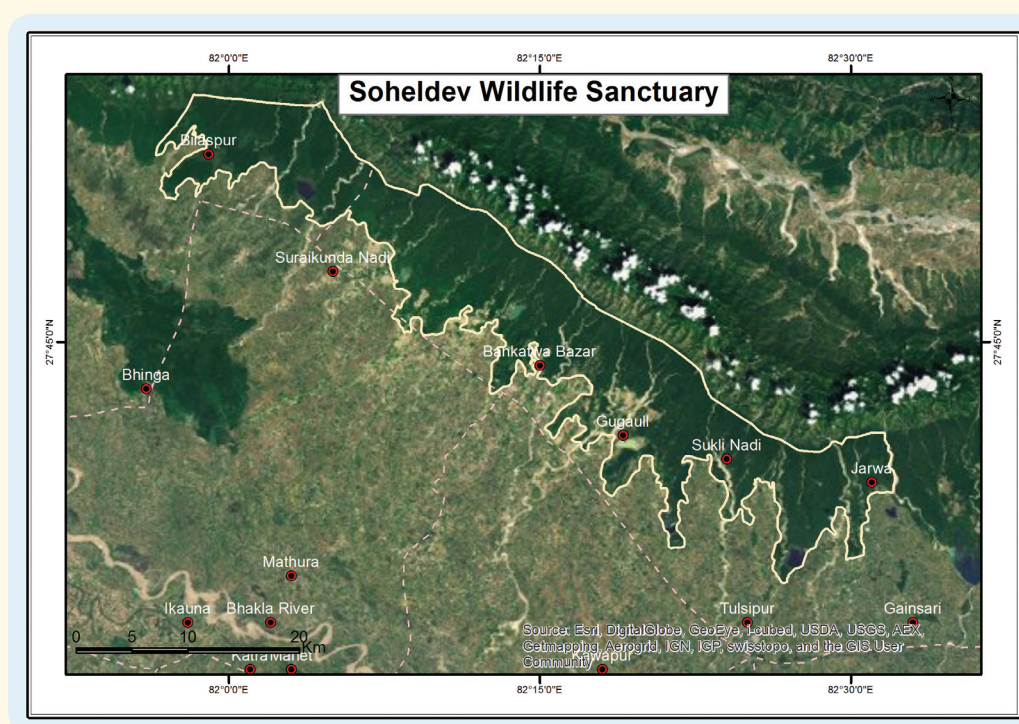
Biogeographic Zone : Gangetic Plain

Habitats : Tropical Moist Deciduous Forest

IN-UP-23

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Wildlife Sanctuary, established November 1988.



GENERAL DESCRIPTION

Sohildev Wildlife Sanctuary was named after Raja Sohildev, king of Sharavasti. The total area of the sanctuary is 42,247 ha and the buffer zone is 22,000 ha. It lies in the Tulsipur *tehsil* of Balrampur district and Bhingra *tehsil* of Sharavasti district along the Indo-Nepal border. The sanctuary is c. 120 km long and 6–8 km broad. This wildlife sanctuary lies in *bhabar-terai* forest, and is flanked by the Nepal border on three sides. The south-western boundary of the park is close to Sharavasti Forest Division in India while the south-eastern boundary lies close to the town of Pachperwa. Located immediately south of the Churia hills of Nepal, the area primarily holds rugged mountains and boulder-strewn riverbeds, especially along the northern boundary (Chanchani *et al.* 2014). Towards the southern boundary, the *bhabar* terrain gives way to flat *terai* floodplains. The area is drained by 8–10 major seasonal

rivers, many of which drain into artificial reservoirs built along the southern boundary of the sanctuary. The unique geophysical attributes of the area, its plantation history, and numerous drainages and reservoirs have given rise to a mosaic of varied forest types such as pure sal, teak, broadleaf moist deciduous, and semi-evergreen forests, and small patches of grassland fringing the reservoirs.

The boundaries of the sanctuary are dotted by numerous villages which depend heavily on the forests for fuel wood, fodder, and other non-timber forest produce (NTFP). Many Nepalese villages are situated along the northern border. Their reliance on Indian markets necessitates frequent travel to towns on the Indian side. Consequently, the forest is bisected by numerous foot trails running north-south. Besides, the Border Security Force (BSF) maintains a few roads within the forests leading to their posts which are located at regular intervals all along the border.



ASAD R. RAHMANI

Suhelwa (Soheldev) Wildlife Sanctuary along the border of Nepal is nearly 120 km long and 5-10 km wide. On the southern side, it has dense human populations which exert tremendous pressure for firewood collection and grazing. Despite this some patches retain original semi-Bhabhar type of forest

Forest areas which constitute the Soheldev Wildlife Division were brought under Government control in 1967. Prior to 1952, only Tulsipur Reserve Forest of Gonda district and Soheldev Reserve Forest of Bahraich district were under Government control, the remaining forests being under the control of Balrampur Estate.

Soheldev Wildlife Sanctuary falls in the Bhabhar area (lower foothills of the Himalaya). It is Sal *Shorea robusta* dominated forest, with *Acacia catechu*, *Syzygium cumini*,

Terminalia tomentosa, and grasses of the genera *Vetiveria*, *Themeda*, *Arundo donax*, *Imperata*, and *Saccharum*. *Tectona grandis* was planted by the Forest Department but since the sanctuary was declared, planting has been stopped.

AVIFAUNA

Owing to great vegetation diversity, the area is a mosaic of diverse habitats, as a result of which faunal diversity is extremely high. About 40 species of mammals and more than 250 species of birds are found, including very good numbers of vultures (200+ individuals of five species) in buffer areas. The old Sal forest patch is home to the Great Slaty Woodpecker *Mulleripicus pulverulentus*. There are a number of water reservoirs within the sanctuary area, which harbour many waterbirds including several threatened birds (Rahmani *et al.* 2015). It is one of the best places to see the Yellow-breasted Bunting *Emberiza aureola*. Nearly 150 birds were seen on April 7, 2014 in the sanctuary (Rahmani *et al.* 2015).

OTHER KEY FAUNA

Besides Tiger *Panthera tigris*, Leopard *P. pardus*, Spotted Deer *Axis axis*, Sambar *Rusa unicolor*, Barking Deer *Muntiacus muntjak*, and Hog Deer *Axis porcinus* are found in the sanctuary.

Chanchani *et al.* (2014) found evidence of livestock in 91% of surveyed segments. Livestock was found uniformly distributed across the area. The situation was similar in

CRITICALLY ENDANGERED

Slender-billed Vulture	<i>Gyps tenuirostris</i>
White-rumped Vulture	<i>Gyps bengalensis</i>

ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>

VULNERABLE

Sarus Crane	<i>Grus antigone</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>
Yellow-breasted Bunting	<i>Emberiza aureola</i>

NEAR THREATENED

Ferruginous Duck	<i>Aythya nyroca</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>



ASAD R. RAHMANI

Suhelwa has many wetlands that add to the bird diversity. More than 250 species of birds have been reported from recent BNHS study, including seven Globally Threatened species.

2004, when the encounter frequency for cattle signs was 91% and was the highest amongst all the other surveyed patches in the Terai Arc Landscape (Johnsingh *et al.* 2004).

In Suhelwa, water scarcity especially through the dry season (November to June) severely limits the populations of both predators and prey. It is possible that the scarcity of water in Suhelwa may produce strong seasonal trends in habitat use by mammals, especially tigers, who may find disturbance-free water sources in the area during monsoon only (Chanchani *et al.* 2014).

LAND USE

- Nature conservation and research
- Tourism and recreation
- Water management

THREATS AND CONSERVATION ISSUES

- Afforestation
- Livestock grazing
- NTFP collection
- Forest fire
- Firewood collection
- Need to develop and enhance trans-boundary cooperation

Grazing and NTFP (non-timber forest produce) collection within the wildlife sanctuary are major conservation issues.

Agriculture around the sanctuary is intensifying. Grassland and forest fires also have a direct impact on wildlife of the sanctuary (Singh 2002).

Fuel wood extraction from the sanctuary creates severe anthropogenic disturbance. During the survey, we came upon tell-tale signs of hunting such as improvised grates over which poached game had been roasted (Chanchani *et al.* 2014). Traps, snares, and other implements used by poachers have also been recovered from these forests in the past (Niharika Singh *per comm.* 2010).

KEY CONTRIBUTOR

Niharika Singh, Rajat Bhargava, V.P. Singh.

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SUR SAROVAR BIRD SANCTUARY

IN-UP-24

IBA Site Code	: IN-UP-24	Area	: 403 ha
State	: Uttar Pradesh	Altitude	: 169 msl
District	: Agra	Rainfall	: >600 mm
Coordinates	: 27° 00' N, 77° 45' E	Temperature	: 2 °C to 48 °C
Ownership	: State	Biogeographic Zone	: Semi-arid
		Habitats	: Freshwater Reservoir

IBA CRITERIA: A1 (Threatened species), A4 iii (Congregation: ≥20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established March, 1991.



GENERAL DESCRIPTION

Sur Sarovar, popularly known as Keetham Lake, was declared a bird sanctuary in 1991, with an area of c. 400 ha. It is c. 17 km from Agra city. The lake is owned by the Irrigation Department. Earlier, drinking water was supplied to Agra from Keetham Lake, but now the water is piped to the Mathura Refinery, c. 24 km away. The river Yamuna flows just 500 m to the northeast of Keetham.

Keetham Lake was named Sur Sarovar Bird Sanctuary, after the great poet Surdas, who lived nearby nearly 500 years ago. The waterbody covers 300 ha and the surrounding buffer zone 400 ha. We have considered the whole waterbody and surrounding areas as an IBA.

The Ministry of Environment and Forests, Government of India identified this wetland under the Wetland Conservation Programme. Sur Sarovar Sanctuary also fulfills Ramsar Criteria 2 (wetland supports threatened

ecological communities), Criteria 5 (wetland regularly supports 20,000 or more waterbirds), and Criteria 6 (wetland regularly supports 1% of the individuals in a population of one species or subspecies) (Islam & Rahmani 2008).

It is also one the most prestigious and well-maintained sanctuaries of the U.P. Forest Department. Nearly 100,000 tourists visit the sanctuary every year, as it is near the “golden triangle” of Agra, Delhi, and Jaipur. It has also become a hub of research on birds, particularly migratory birds (Rahmani *et al.* 2010, Kalra *et al.* 2011). The sanctuary is very well-managed, with dedicated staff. The lake used to be covered with Water Hyacinth *Eichhornia crassipes*, but now the management ensures manual weed removal.

The world’s largest Bear Rescue Centre has been established in the sanctuary, and presently houses 139



ASAD R. RAHMANI

Sur Sarovar, earlier known as Kheetam Lake, used to supply drinking water to Agra city, 17 km away but its water is supplied to Mathura Refinery

Sloth Bear that were rescued from *kalandars* (owners of performing bears). The Bear Rescue Centre is recognized by the Central Zoo Authority, Government of India.

AVIFAUNA

During a brief survey of the site in January 1991, 52 species were seen in this sanctuary (Rahmani & Arora 1991) but the present checklist totals >300 species. There are about 21 small islands in Sur Sarovar Sanctuary (exposed in winter when the water level is low), which support more than 30,000 waterbirds in winter, and a large heronry of Grey Heron *Ardea cinerea*, egrets *Egretta* spp., and cormorants *Phalacrocorax* spp., Black-crowned Night Heron *Nycticorax nycticorax*, Oriental Darter *Anhinga melanogaster*, and Eurasian Spoonbill *Platalea leucorodia*. During winter, most of the common waterfowl of north India, namely Northern Pintail *Anas acuta*, Wigeon *A. penelope*, Northern Shoveller *A. clypeata*, Gadwal *A. strepera*, Spot-billed Duck

A. poecilorhyncha, and Comb Duck *Sarkidiornis melanotos* are seen. Four species of storks are found here: Painted *Mycteria leucocephala*, Asian Openbill *Anastomus oscitans*, Black-necked *Ephippiorhynchus asiaticus*, and Asian Woolly-necked *Ciconia episcopus*. Eurasian Spoonbill, Black-headed Ibis *Threskiornis melanocephala*, four species of egrets, two species of herons, and three species of cormorants can easily be seen from the road around the reservoir. According to forest officials, Great White Pelican *Pelecanus onocrotalus* and Dalmatian Pelican *Pelecanus crispus* are found here in hundreds. In the winter of 2008–2009, 1,100–1,200 Great White Pelican *Pelecanus onocrotalus* and 450–500 Bar-headed Goose visited the sanctuary. Earlier, fishermen used to chase them away, but now the birds are left undisturbed.

Earlier, very few 'heronry' species used to breed in Sur Sarovar, but in 1990, large numbers of egrets, cormorants, herons, Eurasian Spoonbills, and Black-headed Ibis started nesting on the *Prosopis juliflora* trees present on the islands and flooded areas. There could have been more than 2,000 nests. Since then, regular breeding is seen, but the number of nests fluctuates, depending upon the water conditions and food availability in the area. The globally Threatened Sarus Crane *Grus antigone* is seen here, but it is not known whether it breeds in the sanctuary or not. A few Greater Spotted Eagle *Clanga clanga* are seen frequently.

The population of most of the anatids fluctuated in the Sanctuary in the winter of 2008–2009, and there was a large

VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>

degree of movement of birds. BNHS scientists recorded the movement of a Bar-headed Goose fitted with PTT (satellite transmitters), between Sur Sarovar and Keoladeo NP (Kalra *et al.* 2011). This proved that birds move between these two sanctuaries. Better management practices, such as providing more habitats, could support more migratory birds at Sur Sarovar, as it has a huge carrying capacity (Rahmani *et al.* 2010).

OTHER KEY FAUNA

Golden Jackal *Canis aureus*, Jungle Cat *Felis chaus*, and Nilgai *Boselaphus tragocamelus* are found in the surrounding forests. Striped Hyaena *Hyaena hyaena* is also reported, but rarely seen. There is no mammal or reptile species of high conservation concern in the area. The islands in the lake are home to hundreds of Indian Soft-shell and Indian Flap-shell Turtles.

LAND USE

Land holding in Sur Sarovar Bird Sanctuary:

1. Mathura Refinery: Mathura Refinery is holding possession of c. 9.4 ha for installation of machineries and pipelines which was given on lease in 1977.
2. Air Force: About 17 ha land was transferred to Indian Air Force in 1966, for Space Air Guiding Weapons (SAGW) programme. A 40 ha area in the sanctuary is still under the control of the Indian Air Force (IAF) for its Aerial Delivery Station. Earlier, IAF would use it for hydrogen balloon testing experiments, but now this has

been shifted to Babina near Jhansi, so there is a need to transfer the land back to the sanctuary. Although it is well protected by the Army and Forest Department, its boundary fence prevents free movement of terrestrial wild animals. The fence should be removed immediately. Interestingly, the land was leased to the IAF for six months in 1966, but even after the establishment of the sanctuary in 1991, the land was not transferred to the Forest Department.

3. Soor Smarak Mandal: 10.10 ha land was transferred to Soor Sarovar Mandal in 1962 and compound walls were allowed to be established.
4. Horticulture Department: This department is holding possession of c. 33.01 ha of land for FRH activity.
5. Fisheries Department: The Fisheries Department is in possession of about 0.61 ha of land.

Thus total area of about 70.12 ha land is utilized by other holders in Sur Sarovar Bird Sanctuary. It is pertinent to mention that most of these institutions/agencies/undertakings hold a large percentage of area with boundary walls within the sanctuary, fragmenting the habitat severely and depriving the wildlife of valuable habitat, forest cover, and access to other parts of the sanctuary. All of these land holdings are being used for non-forestry activities, and are held in possession by the concerned department in violation of the Forest (Conservation) Act, 1980, and even though in most cases the old lease issued by the Forest Department has long since expired, the physical possession of the land continues to be retained by these agencies in the absence of



ASAD R. RAHMANI

More than 300 species of birds are now reported from Sur Sarovar and surrounding areas.

There are 21 small islands which are exposed as water is supplied to Mathura Refinery.

Tree-covered islands are used by heronry birds to nest while bare islands are used for basking and resting



ASAD R. RAHMAN

Since 1990s, large number of egrets, herons, ibises, cormorants and Eurasian Spoonbills nest on *Prosopis* and *Acacia* trees growing on islands

a legal agreement and in clear violation of Forest laws. It appears that the above agencies do not have approvals and clearances from the National Board for Wildlife (NBWL) and Forest Conservation Division of the MoEF, Government of India. If the land which is held in possession by the various Governmental Departments, Public Sector Undertakings, and other non forestry agencies is returned to the U.P. Forest Department, there will be an increase of about 10 percent in the existing natural wildlife habitats in Sur Sarovar Bird Sanctuary. The only legal activity being carried out in the sanctuary is the Agra Bear Rescue Facility, which was established in 1999 by the Uttar Pradesh Forest Department and Wildlife SOS (an NGO) with the objective of implementing the Wildlife (Protection) Act 1972, to prevent the poaching of endangered Sloth Bear cubs and curb the illegal trade in bears which was rampant until a few years ago.

Conservation action taken by Forest Department: Since the declaration of Keetham Lake as a sanctuary in 1991, the U.P. Forest Department has taken many conservation measures which have enhanced its administrative and biodiversity values. A comprehensive management plan was prepared (Kumar 2010), and Keetham is now one of the finest bird sanctuaries of India.

Habitat Protection: Earlier the sanctuary was heavily lopped and overgrazed, but this has been totally stopped, resulting in good tree, grass, and shrub growth, that benefits forest birds. A large number of woodland avifauna is also present in the sanctuary.

Ban on fishing: This is being effectively implemented, resulting in less disturbance to birds and also more fish

supply to piscivorous birds. Poachers have been arrested and sent to jail and have even been convicted for a year by the concerned court, as informed by the Forest Department officials.

Children's Park, Interpretation Centre, Nature Trails, Watch Towers: Since most of the visitors to Sur Sarovar come to enjoy nature, rather than birdwatching, the sanctuary is equipped with recreational and visitor facilities. These include a children's park, an interpretation center and a wildlife film screening room. A canteen, drinking water and toilet facilities have been provided.

Nature trails have been developed to enable the visitors to explore the area on foot. Bicycles are available on hire. There are four watch towers in the sanctuary.

Peripheral road and fence: The sanctuary is accessed by a 3 km metalled road, which is flanked by *Prosopis juliflora* forests on either side for about a kilometer after entering the sanctuary. The road then skirts Keetham Lake and ends near the canteen.

There is no fencing to demarcate the sanctuary, which makes it porous from all sides, and prone to illicit felling and fishing. The sanctuary is flanked by villages on three sides, and most of the illegal felling is done by the inhabitants of the bordering villages.

CONSERVATION ISSUES

1. Water Supply: Keetham Lake was created to supply drinking water to Agra city. However, Agra city now gets water from other sources, mainly the River Yamuna. The total water surface area (maximum) is about 400 ha, and the maximum water depth could be 7 m. However, the Irrigation

Department, which controls the water inflow and outflow, keeps the water level at maximum depth of 7 m to ensure a continuous water supply to Mathura Refinery. Ideally, the water depth should be maintained between 3-6 m for the proper management of migratory and resident bird habitats in the sanctuary.

2. Mathura Refinery: The Mathura Refinery, the sixth refinery of Indian Oil, was commissioned in 1982 with a capacity of 6.0 Million Metric Tonne Per Annum (MMTPA) to meet the demand of petroleum products in the northwestern region of the country, which includes National Capital Region. The Refinery is located along the Delhi-Agra National Highway, about 154 km from Delhi.

2.1. Water Supply to Mathura Refinery: According to the 25-year agreement with the Irrigation Department, Government of Uttar Pradesh, the Mathura Refinery has been drawing water from Keetham Lake since 1981. In spite of the fact that the inundation of the lake for supplying water to the Refinery, after the agreement expires in 2006, is a commercial activity which requires the clearance of the Standing Committee of the National Board of Wildlife (as per directions of the Supreme Court of India), the lake continues to be inundated and water continues to be supplied to the Refinery in clear violation of the orders of the Supreme Court and the provisions of the Wildlife (Protection) Act, 1972. The Forest Department officials informed that they are yet to receive a proposal from the Mathura Refinery/Irrigation Department for obtaining concurrence of the NBWL for using the water of the Keetham Lake. The Irrigation Department fills the Keetham Lake to capacity every year. This causes the inundation of islands and the immediate banks, destroying essential habitats for a number of bird species.

2.2. Water Treatment Plant: Agreement was made for the supply of non-potable water, but Mathura Refinery has established a Water Treatment Plant of 1550 M³/hr capacity to convert the non-potable water to potable by using highly hazardous chemicals such as chlorine and sodium hypochlorite within the sanctuary area, violating Section 32 of the WPA, 1972, about the ban on the use of injurious substances in protected areas. The lease of the treatment plant located within the sanctuary expired in 2007. We came to know that this agreement has not been renewed. Therefore, technically the water treatment is also illegal. The use of chemicals within the treatment plant that are then released directly into the sanctuary is also of serious concern.

2.3. Expansion of Mathura Refinery: It was learnt that Indian Oil Corporation (IOC) is planning to invest Rs. 8,000 crores for the expansion of Mathura Refinery to raise its production from 6 MTPA to 11 MTPA. Obviously, this would require enhanced water supply to the Mathura Refinery, but no efforts have been made by the Refinery

authorities to seek alternative sources of water. The Environmental Clearance for the expansion has been issued by MoEF, but it was not immediately clear whether the fact that the Refinery is using water from a sanctuary was brought on record in the proposal for Environmental Clearance. If the expansion involves increased withdrawal of water from Keetham Lake, then the project would require the concurrence of the NBWL.

3. Legal Issues: Despite Keetham Lake being declared as Sur Sarovar Bird Sanctuary in 1991 under the Wildlife Protection Act, 1972, and despite a clear directive from the Supreme Court in 2000, water which is a major resource of the wetland sanctuary is being supplied to the Mathura Refinery, although the lease agreement was over in 2007. Legally, water may be supplied to the Mathura Refinery after a new agreement is signed between the sanctuary authorities and Mathura Refinery, but the demand to keep the water level up to 22 feet (thus submerging most islands and destroying low-lying nests) should not be allowed. Water level should be maintained not only to maximize supply to the Refinery but also to maintain the integrity and spirit of the sanctuary.

4. Anand Engineering College: This unit of the Sharda Group of Institutions, established in 1998, has come up within 10 m of the sanctuary. Actually its boundary wall abuts the sanctuary. Though it was established before the Supreme Court order of 2000, and is located on private land, the extensive expansion of the college is in violation of the Supreme Court order of 2000, that prohibits all non-forestry activities within a protected area without the prior permission of the apex court, and without the mandatory permission of the Standing Committee, NBWL.

In clear violation of the WLPA, 1972, the college used to directly discharge all waste and sewage into Keetham Lake. Fortunately, this has been stopped due to timely action by Forest Officers.

CONSERVATION RECOMMENDATIONS

1. Immediate action:

- a) Renewal of the agreement on water supply to the Mathura Refinery from Sur Sarovar Sanctuary should be immediately initiated. Paramount importance should be given to the requirements of the sanctuary to maintain its sand/mud/grass islands and heronry islands. Mathura Refinery should immediately submit a proposal to seek the concurrence of the water supply agreement from NBWL.
- b) Mathura Refinery, while getting the required amount of water, should explore other sources of water such as the newly constructed Gokul Barrage in view of the increased water requirement after the refinery is expanded.

Possibility of lowering the level of the intake well to the increase capacity of lake water and maintaining water capacity below **19 feet[metric]** should be explored.

- c) The treatment plant located inside the Sur Sarovar Bird Sanctuary should be relocated to private land outside the sanctuary, or should be located within the Mathura Refinery premises.
 - d) Pollution: All ingress of pollutants and polluted water in Sur Sarovar Sanctuary should be immediately stopped and defaulters punished.
 - e) Strict watch should be maintained on effluent/ sewage originating from Anand College and Hindustan College on the border of the sanctuary.
 - f) Legal action should be taken against Anand College by the district authorities in accordance with the directions of the High Court, Allahabad.
 - g) A short-term study should be carried out, for at least one year, on the impact of fluctuating water level on birds.
- 2. Long-term actions:**
- 1) Discussion should be initiated at the highest level with the IAF to get back 40 ha of forest land that was given to them for six months in 1966 . The fence/wall of this land should be removed (except the periphery) so animals can move freely all over the sanctuary.
 - 2) Long-term research studies should be started in Sur Sarovar Sanctuary to monitor the bird populations, particularly heronry species, and also on the habitat requirements of resident and migratory birds.
- 3. Others:**
- i. The population of migratory birds during the peak of winter needs to be estimated, and their population monitored at regular intervals to record fluctuation in species composition.

- ii. Grazing pressure from livestock from the six surrounding villages should be regulated.
- iii. The Irrigation Department owns the land, so coordination is required, particularly to maintain adequate water levels for optimum removal of Water Hyacinth. A drain from the Agra Canal comes down to Sur Sarovar from Okhla, carrying Water Hyacinth along with it, which means that re-establishment of the weed is certain even after removal from the lake.

KEY CONTRIBUTORS

Asad R. Rahmani, Sujoy Bannerjee K.S. Gopi Sundar, and Sujit Narwade, .

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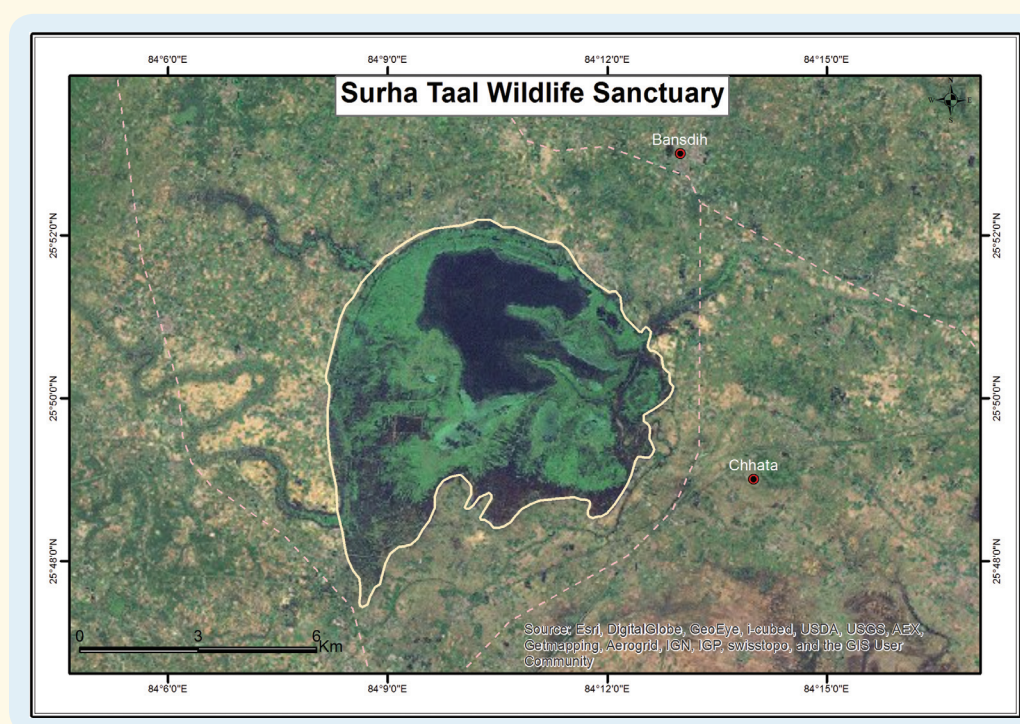
SURHA TAAL WILDLIFE SANCTUARY

IN-UP-25

IBA Site Code	: IN-UP-25	Area	: 3,432 ha
State	: Uttar Pradesh	Altitude	: Not available
District	: Ballia	Rainfall	: Not available
Coordinates	: 25° 45' 00" N, 84° 19' 60" E	Temperature	: 4 °C to 40 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4i ($\geq 1\%$ biogeographic population), A4iii (Congregation: $\geq 20,000$ waterbirds).

PROTECTION STATUS: Wildlife Sanctuary, established March, 1991.



GENERAL DESCRIPTION

Surha Taal, also known as Jai Prakash Narain Pakshi Vihar, is located 8 km north of the district headquarters of Ballia. It is a perennial waterbody, fed by the River Ganga through three streams, namely Madhaha, Gararai, and Katahar. Surha Taal has many shelf-like projections of land on its east and south banks. It has an area of 2,602 ha. During monsoon, it covers c. 3,642 ha. The lake circumference is c. 25.6 km. It is surrounded by extensive agricultural land with paddy and other cereals such as maize, wheat, gram, and groundnut. The exposed area along the margins is used for cultivation of a special variety of rice known as 'floating' or deep-water rice. As water rises, the rice stalk grows to keep the awns (spikes of grain) above water. At harvest time, farmers cut the awns only, leaving the rest of the plant to decompose.

The waterspread of the sanctuary extends through two

tehsils of the district. The southern end comes under Ballia tehsil while the larger northeastern sides part of Bansdeh tehsil.

Surha Taal is surrounded by agricultural fields. *Eichhornia crassipes* is the dominant weed, within and along the margins of the lake. An excellent waterbody serving as host to several migratory and resident bird fauna, this wetland has been listed as a high priority wetland of Level V, i.e. wetland with high ecological and socio-economic potential but with poor data availability, in a prioritization of biological conservation sites in Indian wetlands (Samant 2000). Fishing is very common. Local farmers use the lake water for irrigation. The vegetation is used as fodder for domestic livestock and as firewood.

AVIFAUNA

Surha Taal WLS is famous for its congregation



DHRITIMAN MUKHERJEE

In winter, sometimes the number of waterfowl reaches more than 50,000. There is an urgent need for coordination of Forest and Fisheries departments to curtail fishing during bird migratory season

of waterbirds during winter. Anatidae is the most numerous among all the families recorded, followed by Phalacrocoracidae, Jacanidae, and Ardeidae. According to the Forest Department, the number reaches 50,000 waterfowl during the migratory season (winter). Sarus Crane *Grus antigone* is usually seen breeding in this sanctuary. A complete checklist of birds is not available.

VULNERABLE

Sarus Crane	<i>Grus antigone</i>
Greater Spotted Eagle	<i>Clanga clanga</i>

NEAR THREATENED

Ferruginous Duck	<i>Aythya nyroca</i>
Black-headed Ibis	<i>Threskiornis melanoleucus</i>
Oriental Darter	<i>Anhinga melanogaster</i>
River Tern	<i>Sterna aurantia</i>

OTHER KEY FAUNA

Not much information is available on other fauna. This wetland is supposed to be very important for its fish resources. According to a study on the fish fauna of Surha Taal has about 60 species belonging to 40 genera, 22 families, and 8 orders. Ganga and Sarju rivers are the main sources of the fish fauna of Surha Taal.

LAND USE

- Fishing
- Agriculture
- Nature conservation

THREATS AND CONSERVATION ISSUES

- Uncontrolled fishing
- Draining of water for irrigation
- Weed infestation
- Unsustainable exploitation

Like all other such wetlands located in areas of high human population density, Surha Taal is presently under tremendous biotic pressure from fishing, weed infestation, and drainage for cultivation. Local farmers use the lake water for irrigation. Surha Taal is an important natural resource for fisheries in Ballia district in particular, and one of the most important and abundant resources which form the lifeline for rural economy and environment of this area. Furthermore, a large human population which lives close to Surha Taal, uses its water for drinking, washing, and bathing. The water from Surha Taal is extracted by a canal with the help of high powered hydraulic pumps for the irrigation of agricultural land.

KEY CONTRIBUTORS

K.S. Gopi Sundar, V.P. Singh, Neeraj Srivastav.

KEY REFERENCES

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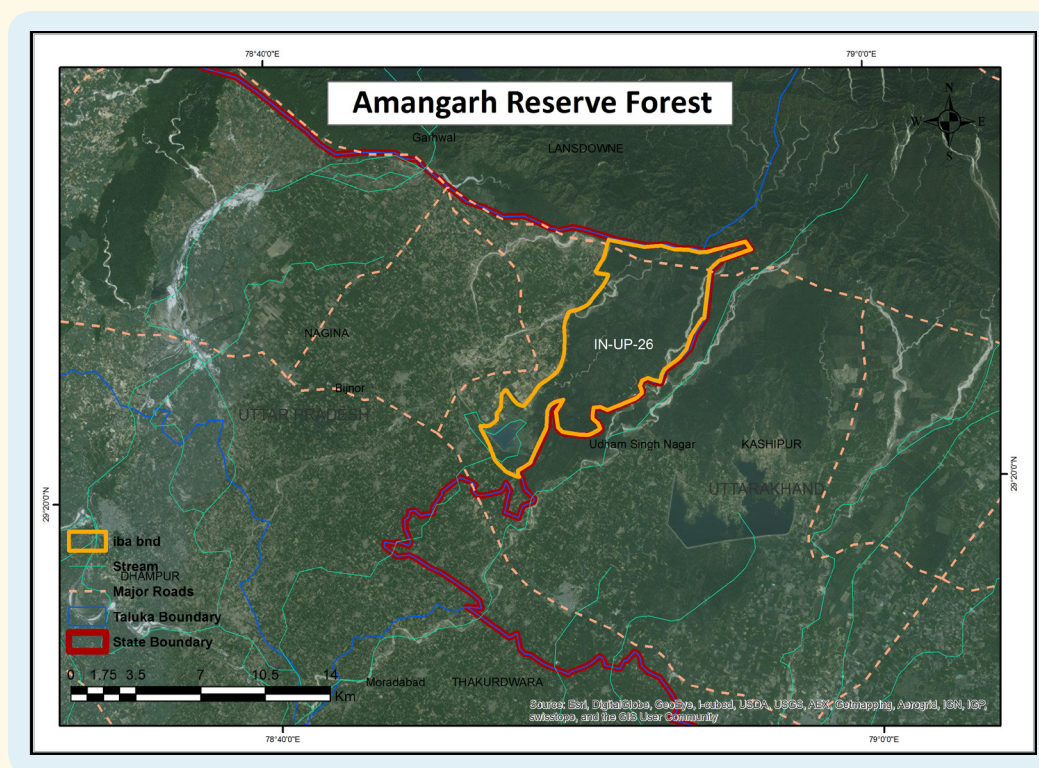
AMANGARH RESERVE FOREST

IN-UP-26

IBA Site Code	: IN-UP-26	Altitude	: 400–1,210 msl
Administrative Region (State)	: Uttar Pradesh	Rainfall	: 1,400 mm
District	: Bijnor	Temperature	: 2 °C to 47 °C
Coordinates	: 29° 24' 12" N, 78° 51' 13" E	Biogeographic Zone	: Himalaya
Ownership	: State	Habitats	: Sub-alpine Forest, Tropical Dry
Area	: 9,542 ha (including Pili dam 90 ha)		: Deciduous Forest, Tropical Moist Deciduous Forest, Reservoir

IBA CRITERIA: A1 (threatened species), A4 iii (>20,000 waterbirds)

PROTECTION STATUS: Part of Corbett Tiger Reserve landscape but Corbett is in Uttarakhand and Amangarh is in Uttar Pradesh, hence considered a separate IBA.



GENERAL DESCRIPTION

Amangarh Range comes under the Social Forestry Division of Bijnor district. Spread over 9,500 ha, it was part of Corbett Tiger Reserve in undivided Uttar Pradesh, and marked as the buffer zone of the tiger reserve. Geographically, Amangarh lies in the *terai* region of the Himalayan foothills. The tourism zone of Amangarh is situated between Ramnagar and Kalagarh (now in Uttarakhand); north of it lies Jhirna tourism zone of Corbett Tiger Reserve. The forest consists of dense Sal *Shorea robusta*, interspersed chiefly with planted Teak *Tectona grandis*, Eucalyptus, and other species. The perennial Phika, Banalli, and Kothiro streams flow through the forest, and provide water to wild fauna. Pili reservoir on the fringes is a rainfed perennial waterbody which forms as

integral part of the landscape, with grassland and forests in the backdrop.

AVIFAUNA

As a part of the Corbett Tiger Reserve, Amangarh also has Critically Endangered Slender-billed Vulture *Gyps tenuirostris* and White-rumped Vulture *G. bengalensis*. Red-headed Vulture *Aegypius calvus* is also frequently seen. All these vultures probably breed in the area although no work has been done to know their status.

Owing to the diverse landscape and vegetation, this area supports great avifaunal diversity. Although no regular record of avifaunal diversity of Pili reservoir is maintained, sporadic sight records have revealed the presence of high

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>

ENDANGERED

Black-bellied Tern	<i>Sterna acuticauda</i>
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VULNERABLE

Lesser Adjutant	<i>Leptoptilos javanicus</i>
Pallas's Fish-eagle	<i>Haliaeetus leucoryphus</i>
Greater Spotted Eagle	<i>Clanga clanga</i>
Eastern Imperial Eagle	<i>Aquila heliaca</i>
Sarus Crane	<i>Grus antigone</i>
Great Slaty Woodpecker	<i>Mulleripicus pulverulentus</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Pochard	<i>Aythya nyroca</i>
Lesser Fish-eagle	<i>Ichthyophaga humilis</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaetus</i>
Cinereous Vulture	<i>Aegypius monachus</i>
Pallid Harrier	<i>Circus macrourus</i>
Black-bellied Tern	<i>Sterna acuticauda</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
River Lapwing	<i>Vanellus duvaucelii</i>
Great Thick-knee	<i>Esacus recurvirostris</i>

avifaunal diversity. Its large waterspread attracts migratory and resident waterbirds. At the peak of winter, the waterfowl count touches more than 20,000 birds. During a bird survey by Wild Bird Protection Society in April 2011, 61 species were counted in and around Pili reservoir. The main species were Black-bellied Tern *Sterna acuticauda*, Painted Stork *Mycteria leucocephala* (more than 100 seen), and a variety of ducks and waders. A pair of Black-necked Stork *Ephippiorhynchus asiaticus* was noticed by Sanjay Kumar in 2013.

Being part of the larger Corbett landscape, Amargarh has most of the Biome-8 (Sino-Himalayan Sub-tropical Forest), with some elements of Biome-7 (Sino-Himalayan Temperate Forests) in winter particularly, and also Biome-12 (Indo-Gangetic Plains). Till now ten globally Threatened and 13 Near Threatened species have been identified from this IBA.

OTHER KEY FAUNA

As it is a part of the larger Corbett landscape, most of the animals found in Corbett NP in Uttarakhand are also found in Amargarh Reserve Forest. Among the larger mammals, Tiger *Panthera tigris*, Leopard *P. pardus*, Asiatic Elephant *Elephas maximus*, Sambar *Rusa unicolor*, Cheetal *Axis axis*, Barking Deer or Indian Muntjac *Muntiacus muntjak*, Wild Boar *Sus scrofa*, Goral *Naemorhedus goral*, Sloth Bear *Melursus ursinus*, and Golden Jackal *Canis aureus* are noteworthy. Among the reptiles, the largest of the poisonous snakes, King Cobra *Ophiophagus hannah*, and Python *Python molurus* are frequently seen.

LAND USE

- Fishing in Pili reservoir
- Agriculture on the fringes

THREATS AND CONSERVATION ISSUES

- Contract for fishing
- Firewood collection
- Poaching
- Encroachment on forest land
- Agriculture and use of pesticides

KEY CONTRIBUTORS

Neeraj Srivastav, Mohd Gulfam, Sanjay Kumar.

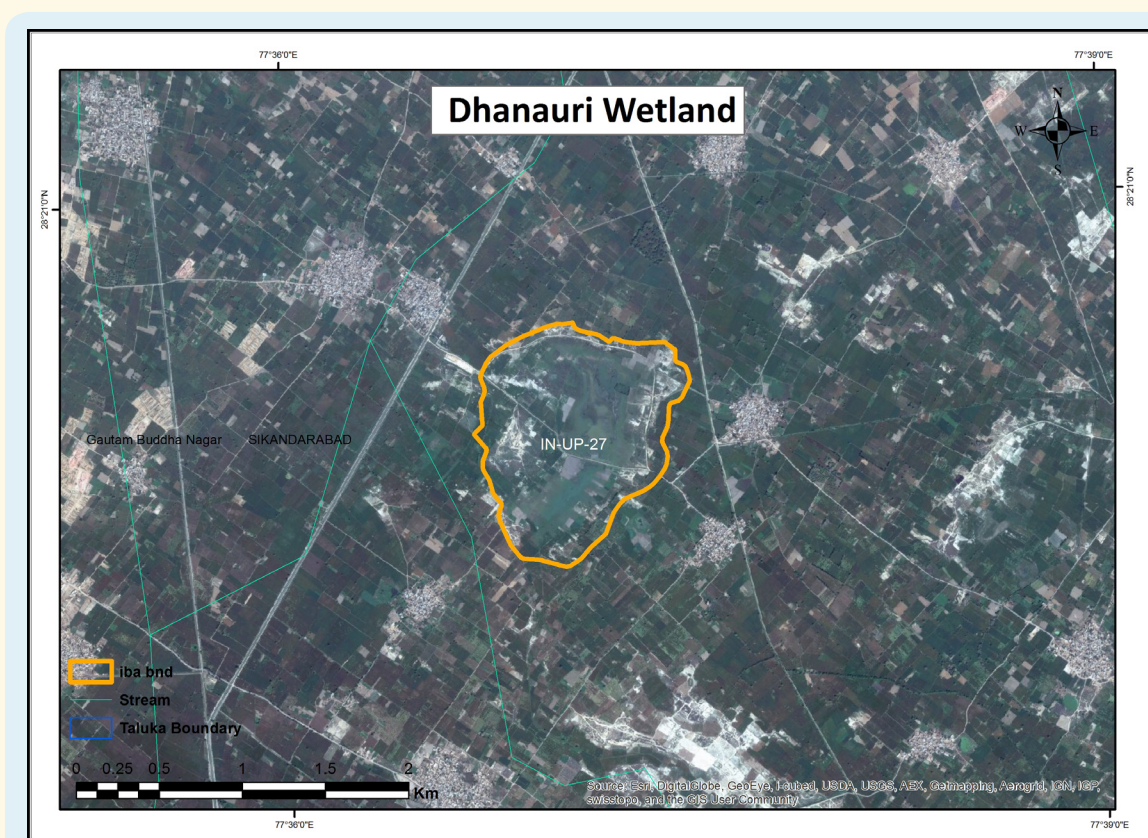
DHANAURI WETLAND

IN-UP-27

IBA Site Code	: IN-UP-27	Area	: 110 ha
State	: Uttar Pradesh	Altitude	: Not known
District	: Gautam Budh Nagar (Greater Noida)	Rainfall	: Not known
Coordinates	: 77° 36' 45.52" N, 28°20' 25.90" E	Temperature	: 1 °C to 48 °C
Ownership	: Revenue, Gram Samaj	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: $\geq 20,000$ waterbirds)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Dhanauri wetland is situated in Greater Noida in Gautam Buddha Nagar district and approximately 10 km away from the Dhankaur railway station on the main Kanpur-Delhi rail route. The marsh is situated just alongside Dhanauri Khurd, one of the villages that form the periphery of the wetland. Other villages in the purview are Thasrana and Amipur. The area is dotted with wetlands as can be seen in the satellite images on Bhuvan (Website of ISRO-NRSC). Dhanauri and the adjoining wetlands are primarily rain-fed but also receive water from the spillover of the surrounding irrigation channels.

AVIFAUNA

The Dhanauri wetland is home to over 100 Sarus Cranes *Grus antigone*, which can be seen regularly. Anand Arya in 2014 had counted 130 cranes. However, during the Sarus Census conducted by the State Forest Department of Gautam Buddha Nagar in 2014, 93 birds were recorded from this area. The population fluctuates as birds move between wetlands and crop fields. Maximum number is seen during the summer months, when smaller wetlands dry up and some water is left in Dhanauri wetland. At least six pairs breed in the area and most of them are able to raise at least one chick per year (Anand Arya *pers. comm.* 2014).



ASAD R. RAHMANI

It is a new IBA recently came to limelight due to the presence of nearly 130 Sarus Crane *Grus antigone*. As Dhanauri is surrounded by intense agricultural fields, there is a need to quickly identify the land holdings and get support of the local communities

VULNERABLE

Greater Spotted Eagle	<i>Clanga clanga</i>
Sarus Crane	<i>Grus antigone</i>

NEAR THREATENED

Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Ferruginous Duck	<i>Aythya nyroca</i>
Black-tailed Godwit	<i>Limosa limosa</i>

The area is home to about 200 species of birds. Between late October and early November, many flocks of wintering waterbirds stop over at this site before continuing their southbound journey. The principal waterfowls are the Northern Shoveller *Spatula clypeata*, Common Teal *Anas crecca*, Eurasian Wigeon *Anas penelope*, Greylag Goose *Anser anser* besides other species. The most common wader species that uses this wetland as a stopover site is the Black-tailed Godwit *Limosa limosa*. Common Crane *Grus grus* is another prominent species which is seen in winter.

For an increasing number of birdwatchers that visit this area, sightings of Common Crane, Northern Lapwing *Vanellus vanellus* and Pied Avocet *Recurvirostra avosetta* are prized additions to their list of birds seen and a mark of the rich bird life of the area.

OTHER KEY FAUNA

With protection efforts by local conservation groups and community, Jungle Cat *Felis chaus* and Golden Jackal *Canis aureus* have appeared, along with the Bluebul *Boselaphus tragocamelus*. The Monitor Lizard *Varanus bengalensis* has also benefitted and can be seen on the fringes where undergrowth is thick.

LAND USE

- Agriculture
- Grazing
- Fishing

THREATS AND CONSERVATION ISSUES

This site is considered as a high priority wetland. That is, wetland with high ecological and socio-economic potential, but with poor data availability. Since the wetland is considered as part of the community landscape or no restriction zone as we may call it, obviously, no conservation ethics are followed. People use this wetland and its produce like any other free resource. Open cattle grazing and fishing are rampant. Poaching is also reported. Illegal trade in some bird species, mainly water birds, has been reported. The illegal catch finds its way to the local market. But the positive side is that the people, by and large, pay respect to the waterfowl and wildlife by not trapping or killing them directly. Considering the potential of the wetland, some action groups from NOIDA have taken the initiative to get this wetland the status of eco-sensitive zone or community conserve area. An e-petition in this regard has been filed. It is important to protect Dhanauri and adjoining wetlands so as to protect the Sarus Crane and other migratory birds. By sincere intervention from the State Forest Department, the controlling authority in this case, and with the support of local conservation groups and community, the wetland could be restored to its ideal habitat status, i.e. open sheet of water, through banning of contractual fishing, poaching and regular removal of invasive weeds.

KEY CONTRIBUTORS

Anand Arya, Neeraj Srivastav.

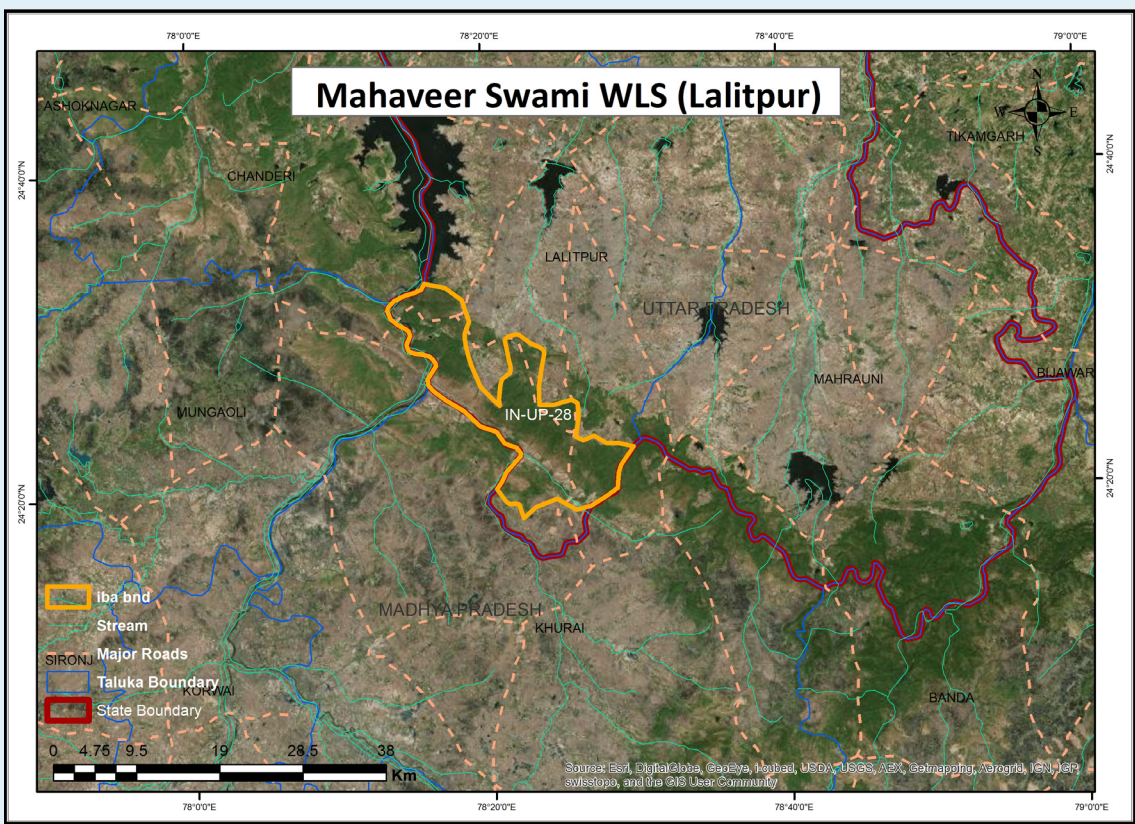
MAHAVEER SWAMI WLS (LALITPUR)

IN-UP-28

IBA Site Code	: IN-UP-28	Area	: 74,236.86 ha & 1,241.08 ha
Administrative Region (State)	: Uttar Pradesh	Altitude	: 90 to 700 msl
District	: Lalitpur	Rainfall	: >1,000 mm
Coordinates	: 24° 10' to 25° 12' N, 78° 10' to 79° 00' E	Temperature	: 4 °C to 45 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Dry Deciduous Forest

IBA CRITERIA: A1 (Threatened species)

PROTECTION STATUS: Lalitpur Forest Division reconstituted in 1986; Mahaveer Swami Wildlife Sanctuary established in 1977.



GENERAL DESCRIPTION

Lalitpur is a border district, situated at the southwestern tip of the state of Uttar Pradesh. It is surrounded on three sides by the state of Madhya Pradesh. It was formerly part of the state of Chanderi, founded in the 17th century by a Bundela Rajput who was descended from Rudra Pratap of the kingdom of Orchha. Chanderi, along with most of Bundelkhand, came under Maratha hegemony in the 18th century. In 1844, the state of Chanderi was ceded to the British and became the Chanderi district of British India, with Lalitpur as its district headquarters. The British lost the district in the First Indian War of Independence in 1857, but was reconquered by them in late 1858. In 1861, the portion of the district west of Betwa river, including

Chanderi, was returned to Gwalior, and the remainder was renamed Lalitpur district. Lalitpur district remained part of Jhansi district from 1891 to 1974. Reconstituted in 1974, Lalitpur district is the heartland of the Bundelkhand region. It joins Jhansi district of Uttar Pradesh by a narrow corridor to the northeast, but is otherwise almost completely surrounded by the present state of Madhya Pradesh. To its east lies Tikamgarh district, to the south Sagar district, and to the west Ashoknagar and Shivpuri districts of Madhya Pradesh.

Mahaveer Swami WLS is part of Lalitpur district and situated in Deogarh, sharing a boundary with Madhya Pradesh. River Betwa bisects the area and forms the natural boundary of the sanctuary. Mahaveer Swami WLS

was established vide U.P. Government notification no. 8269/14-3-5 dated 25.03.77. It is located 33 km from the district headquarters at Lalitpur, to which it is connected with a metalled road. Earlier, the sanctuary was under the administrative control of Lalitpur Forest Division, but presently it is under the administrative control of Kaimur Wildlife Division, Mirzapur. A unique feature of this sanctuary is a group of 41 Jain temples covering an area of c. 8 acres in its midst.

The area is generally rocky. The highest elevation is in the extreme south, with scarps of the Vindhyan plateau, running southeast from Betwa and gradually breaking up into a confined mass of hills, some of which approach a height of 650 msl. North of the scarp, an undulating plain of black soil, interrupted by hills and scoured by numerous channels, stretches north beyond the town of Lalitpur and gradually becomes rockier.

Most of the area is drained by the main tributary of Betwa, River Jamni, which forms its eastern boundary, separating Lalitpur from Tikamgarh district in Madhya Pradesh. River Betwa forms the western and northern boundaries and drains the western part of the district. The southeastern part is partly drained by Dhasan river. The hills in the southern part of the IBA generally occur in small groups or in a continuous narrow chain from northeast to southwest, the ridges being mostly bare and sharp. The slopes are still comparatively better covered with scrub jungle. Smaller rivers that traverse the area are Shahzad and Saznam.

AVIFAUNA

Dense to modest forest cover, scattered trees, rocky cliffs overlooking riverine habitats, and open agricultural fields provide ideal landscape for vultures to breed and roost. They may aptly be called the indicator species of this area. During the surveys conducted from time to time, regular sightings of White-rumped Vulture *Gyps bengalensis*, and Indian or Long-billed Vulture *Gyps indicus* were made. During a survey in 2010 by the Forest Department, c. 500 vultures were counted in the whole Lalitpur Forest Division (BIODIVNEWS, Newsletter of the UP State Biodiversity Board 1(4): Jul-Sep 2010). Again in May and December, 2011, two surveys were conducted, when a total of 27 and 30 nests, and a total of 99 and 80 individuals of these two species were recorded from five different locations in the sanctuary.

In a recent survey, in December, 2014, a total of 37 nests and 78 vultures were observed in this IBA. The preferred trees for nesting and roosting were Sacred Fig *Ficus*

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Long-billed Vulture	<i>Gyps indicus</i>
Red-headed Vulture	<i>Aegypius calvus</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Sarus Crane	<i>Grus antigone</i>
Bristled Grassbird	<i>Chaetornis striata</i>
NEAR THREATENED	
Painted Stork	<i>Mycteria leucocephala</i>
Darter	<i>Anhinga melanogaster</i>
Cinereous Vulture	<i>Aegypius monachus</i>

religiosa, Banyan *Ficus bengalensis*, Silk Cotton *Bombax ceiba*, and Sissoo *Dalbergia sissoo*, in that order. Five species of vultures were seen. The most common was Egyptian Vulture *Neophron percnopterus*, then White-rumped Vulture and Indian Vulture. The Cinereous Vulture *Aegypius monachus* and Red-headed Vulture *Aegypius calvus* were the least common.

The area is rich in other birdlife. No systematic list of bird species is available, but a preliminary list includes 150 species of commonly seen birds (Sanjeev Sharma & Rakesh Kr Prajapati, *pers. comm.* 2015).

OTHER KEY FAUNA

Mahaveer Swami WLS, or Deogarh WLS, as it is locally called, has a long history of protection, probably due to the local influence of Jain philosophy which is strictly non-violent. The major carnivores are Hyaena *Hyaena hyaena*, Golden Jackal *Canis aureus*, and Jungle Cat *Felis chaus*. Nilgai or Blue Bull *Boselaphus tragocamelus* and Common Langur *Semnopithecus entellus* are found in large numbers. In the rivers, March Crocodile, turtles, and a large variety of fish are found.

THREATS AND CONSERVATION ISSUES

- Encroachment on forest land (Lalitpur Forest Division)
- Illegal mining (Lalitpur Forest Division)
- Uncontrolled grazing
- Illegal cutting of trees
- Trespassing and illegal fishing
- Use of prohibited veterinary drugs

KEY CONTRIBUTORS

Neeraj Srivastav, Rakesh Kumar Prajapati.

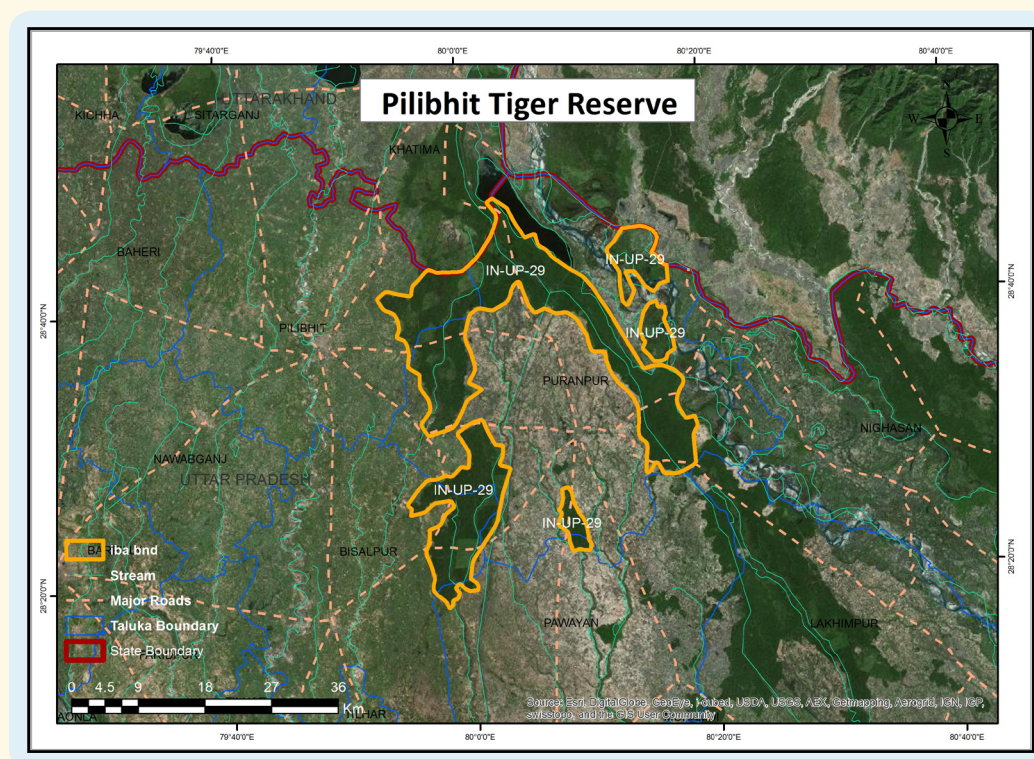
PILIBHIT TIGER RESERVE

IN-UP-29

IBA Site Code	: IN-UP-29	Area	: 71,288 ha
Administrative Region (State)	: Uttar Pradesh	Altitude	: 150–180 msl
District	: Pilibhit	Rainfall	: 1,700 mm
Coordinates	: 28° 52' to 28° 46' N, 79° 55' to 82° 15' E	Temperature	: 4 °C to 45 °C
Ownership	: State	Biogeographic Zone	: Gangetic Plain
		Habitats	: Moist Deciduous Forest, Dry Deciduous Forest, Tropical Grassland

IBA CRITERIA: A1 (Threatened species), A3 (Biome 12: Indo-Gangetic Plains)

PROTECTION STATUS: Tiger Reserve, established 2014.



GENERAL DESCRIPTION

Pilibhit Tiger Reserve, situated in the foothills of the Himalaya in Pilibhit Forest Division, is under the management of five forest ranges, namely Barahi, Haripur, Deoria, Mala, and Mahouf. Pilibhit TR connects with the Terai-Bhabar forests of Surai Range in Terai East Forest Division (FD) in the northwest and with Kishanpur Wildlife Sanctuary (WLS) in the southeast. This division provides connectivity to the Sukla Phanta Wildlife Reserve in Nepal through Lagga-Bagga Forest Block (WWF-India 2010).

The vegetation of Pilibhit Tiger Reserve is a mosaic of dry and moist deciduous forests, scrub savannah and alluvial grasslands. Small ditches, ponds, and perennial rivers such as Sharda, Mala, Khannot, Chuka, and Gomti are the major sources of water. The main Sharda canal, and other canals

that pass through the area, provide water for wildlife even at the peak of summer (WWF-India 2010).

Pilibhit TR is categorized under the Terai-Bhabar biogeographic subdivision of the Upper Gangetic Plains (7A), according to the biogeographic classification of Rodgers & Panwar (1988).

AVIFAUNA

Not much work has been done on the avifauna of Pilibhit TR, but considering the similarities with the forest types of Dudhwa, where more than 330 species of birds have been recorded (Javed & Rahmani 1998), it is likely that similar numbers would be found here. The site falls in Biome 12, but species of Biomes 5, 7, 8, and 11 are also reported from the site.

The most important trigger species for this IBA are the Critically Endangered Bengal Florican *Houbaropsis bengalensis* and Vulnerable Swamp Francolin *Francolinus gularis*. Up to five adult territorial male Bengal Floricans have been noted during recent studies (Rahmani *et al.* 2014). Three floricans were tagged with satellite tracking instruments in May, 2014, of which two are being followed. The Swamp Francolin is found in many suitable wet grassland sites, particularly near perennial wetlands, river beds, and canal seepage.

Three Critically Endangered vulture species are occasionally seen in the IBA, but no nest has been found yet. The Endangered Egyptian Vulture *Neophron percnopterus* is seen on the rubbish dumps in nearby villages. The Vulnerable Sarus Crane *Grus antigone* is also seen, just 3 km from Mahauf Range, in a wetland near Nuria Hussainpur village. It is also seen in Sharda Sagar during summer. Great Slaty Woodpecker *Mulleripicus pulverulentus* has not been seen till now, but considering the extent of mature Sal forest, it is likely to occur here in small number.

BirdLife International (undated) has identified 13 species of Biome 12 (Indo-Gangetic Plains), of which six have been seen in Pilibhit grasslands.

CRITICALLY ENDANGERED	
White-rumped Vulture	<i>Gyps bengalensis</i>
Slender-billed Vulture	<i>Gyps tenuirostris</i>
Red-headed Vulture	<i>Aegypius calvus</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
ENDANGERED	
Egyptian Vulture	<i>Neophron percnopterus</i>
VULNERABLE	
Lesser Adjutant	<i>Leptoptilos javanicus</i>
Asian Woollyneck	<i>Ciconia episcopus</i>
Swamp Francolin	<i>Francolinus gularis</i>
Sarus Crane	<i>Grus antigone</i>
Grey-breasted Prinia	<i>Prinia cinereocapilla</i>
NEAR THREATENED	
Oriental Darter	<i>Anhinga melanogaster</i>
Painted Stork	<i>Mycteria leucocephala</i>
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>
Black-headed Ibis	<i>Threskiornis melanocephalus</i>
Himalayan Griffon	<i>Gyps himalayensis</i>
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>
Pallid Harrier	<i>Circus macrourus</i>
Laggar Falcon	<i>Falco jugger</i>
Great Pied Hornbill	<i>Buceros bicornis</i>
Alexandrine Parakeet	<i>Psittacula eupatria</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>
BIOME 12: INDO-GANGETIC PLAINS	
Swamp Francolin	<i>Francolinus gularis</i>
Bengal Florican	<i>Houbaropsis bengalensis</i>
White-tailed Stonechat	<i>Saxicola leucura</i>
Striated Babbler	<i>Turdoides earlei</i>
Rufous-rumped Grassbird	<i>Graminicola bengalensis</i>
Black-breasted Weaver	<i>Ploceus bengalensis</i>

OTHER KEY FAUNA

Pilibhit Tiger Reserve has all the major faunal components of *terai* forests. Large mammals that have been reported include Tiger *Panthera tigris* and five species of deer (Swamp Deer *Rucervus duvaucelii*, Sambar *Rusa unicolor*, Cheetal *Axis axis*, Hog Deer *Axis porcinus*, and Barking Deer *Muntiacus muntjak*). Pellets of Hispid Hare *Caprolagus hispidus* have been found in many grasslands. Other important mammals include Sloth Bear *Melursus ursinus*, Ratel *Mellivora capensis*, Large Indian Civet *Viverra zibetha*, Golden Jackal *Canis aureus*, Jungle Cat *Felis chaus*, and Leopard *Panthera pardus*. Fishing Cat *Prionailurus viverrinus* is likely to occur, although it has not been seen till now. Crocodile *Crocodylus palustris*, Common Otter *Lutra lutra*, and Bengal Monitor Lizard *Varanus bengalensis* can be observed near the river banks.

LAND USE

- Nature conservation and research
- Tourism and recreation

THREATS AND CONSERVATION ISSUES

- Poaching on the fringes
- Untimely forest fires
- Fuel wood collection (now curtailed to some extent)
- Cattle grazing (now curtailed)

Pilibhit TR is surrounded by large human settlements and its inverted U-shape, along with a large, bustling town, Puranpur, create huge management problems. To the west of the reserve is Uttarakhand and to the north Nepal.

Till a few years ago, cattle grazing was rampant but since the declaration of Pilibhit Tiger Reserve, it has been stopped completely. However, this may have its own consequences. The Bengal Florican prefers short grass for display and foraging, which is maintained in summer through ungulate grazing. As the natural ungulate population of deer is low and there is no large ungulate remaining (Elephant, Rhinoceros, and Wild Buffalo are all extinct in Pilibhit), the grazing regime has been totally disrupted. To some extent, limited livestock grazing played a beneficial role by keeping grass low and sparse. After the declaration of the reserve, cattle grazing and other activities were checked.

Therefore, we suggest that limited livestock grazing may be allowed in certain florican grasslands till the wild ungulate population has been built up. A detailed long-term study on the grassland dynamics of Pilibhit Tiger Reserve is necessary.

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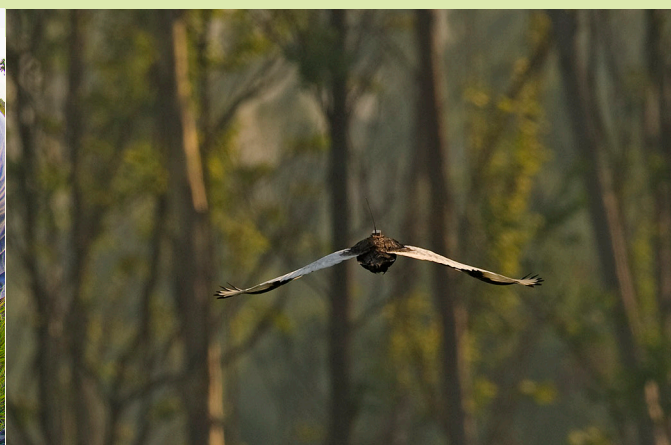
Asad R. Rahmani, Rohit Jha, Rahul Talegaonkar, Brides Chauhan

DHIRTIMAN MUKHERJEE



Bengal Florican *Houbaropsis bengalensis* (above) is a critically endangered species. BNHS with the support of UP Forest Department, MoEF, Darwin initiative and RSPB have done studies on the movement of the florican by deploying PTT (below) on 3 birds. Such studies are extremely important for protection and management of the Bengal Florican habitat

DHIRTIMAN MUKHERJEE



DHIRTIMAN MUKHERJEE

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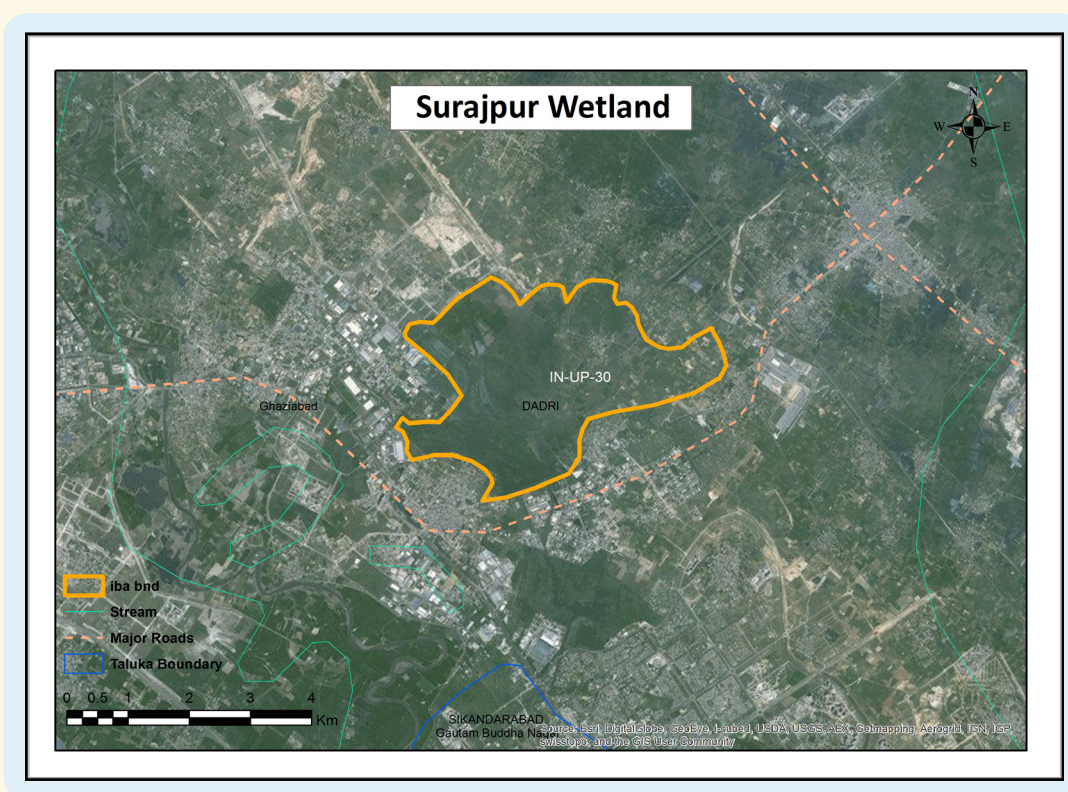
SURAJPUR WETLAND

IN-UP-30

IBA Site Code	: IN-UP-30	Area	: 308 ha
Administrative Region (State)	: Uttar Pradesh	Altitude	: 184.7 msl
District	: Gautam Budh Nagar (Noida)	Rainfall	: 400-500 mm
Coordinates	: 28° 31'42" N, 77° 29'71" E	Temperature	: 1 °C to 48 °C
Ownership	: Forest (Reserve forest)	Biogeographic Zone	: Gangetic plains
		Habitats	: Freshwater swamps

IBA CRITERIA: A1 (Threatened species), A4iii (Congregation: ≥20,000 waterbirds)

PROTECTION STATUS: Reserve Forest



GENERAL DESCRIPTION

Surajpur wetland is situated near Surajpur village in Dadri *tehsil* of district Gautam Budh Nagar under the Greater Noida Development Authority. This wetland is located 26 km from Delhi on Delhi-Noida-Dadri road and 6 km from Dadri Railway station, 90 km from Aligarh and 20 km from Noida (Anon. 2013).

The wetland falls in the Gangetic Plain Biogeographic zone (Rodgers and Panwar 1988). The area is reserve forest and spreads over 308 ha. (3.08 km²) that includes 60 ha. (0.60 km²) of natural wetland. The terrain of the area is almost plain, although the tract divides the area into flat terrestrial form and deep wetland area. Surajpur wetland is mainly rain-fed. Other sources for water recharge are catchment area of Hawaliya drain which are connected to Hindon River, and the irrigation

canal of Tilapta Minor, which originates from Kulesra bund on the Hindon River. Surajpur wetland is created through the combined effort of Uttar Pradesh Forest Department and the Greater Noida Industrial Development Authority. They, in collaboration with WWF-India, have initiated a project on the conservation planning and development of Surajpur wetland in 2010 (Prabhakar *et al.* 2013).

AVIFAUNA

Surajpur wetland represents the mosaic of habitats supporting diverse flora and fauna. About 186 species of birds belonging to 44 families, 102 resident and 53 winter migrant, are reported from this wetland so far. Interventions like creation of bunds around the water body to ensure the stay of water during winters and small

ENDANGERED

Egyptian Vulture *Neophron percnopterus*

VULNERABLE

Greater Spotted Eagle *Clanga clanga*
Sarus Crane *Grus antigone*
Bristled Grassbird *Chaetornis striata*

NEAR THREATENED

Oriental Darter *Anhinga melanogaster*
Painted Stork *Mycteria leucocephala*
Black-necked Stork *Ephippiorhynchus asiaticus*
Black-headed Ibis *Threskiornis melanocephalus*
Ferruginous Duck *Aythya nyroca*
Black-tailed Godwit *Limosa limosa*



SURAJ PRAKASH

Surajpur wetland with its abundant birdlife has come into limelight during the last 5 years. It is a new IBA

mounds within the water body to provide resting site for migratory birds proved useful and result in a heavy turnout of avifauna (Prabhakar *et al.* 2013). Some of the prominent winter waterfowl are; Northern Shoveler *Spatula clypeata*, Northern Pintail *Anas acuta*, Ruddy Shelduck *Tadorna ferruginea*, Eurasian Wigeon *Mareca penelope* and Common Teal *Anas crecca*. One of the notable sightings is of Bristled Grassbird *Chaetornis striata* that was regularly noted in summer (June-August, 2010). The bird was seen singing from high perches (Anand Arya *pers. comm.* 2010). Besides this, at least three breeding, territorial pairs of Sarus *Grus antigone* have made the wetland their permanent home. Other resident waterbirds include Bronze-winged Jacana *Metopidius indicus*, Pheasant-tailed Jacana *Hydrophasianus chirurgus*, Painted Stork *Mycteria leucocephala* and Black-necked Stork *Ephippiorhynchus asiaticus*. This wetland is exceptionally good in keeping records of avifaunal inventory since the restoration of this wetland started a few years ago by the U.P. Forest Department. Now huge numbers of waterbirds are found in this newly protected wetland. The site easily qualifies A1 (threatened species) and A4iii (>20,000 waterbirds) criteria.

OTHER KEY FAUNA

The wetland also supports six species of mammals includes Nilgai, Indian Grey Mongoose, Indian Hare, Golden Jackal and Five-striped Squirrel, 15 species of fishes,



NEERAJ SRIVASTAV

Government of Uttar Pradesh has taken measures to protect the wetland. It has become a birding destination

11 species of herpeto-fauna, 52 species of butterflies. More than 220 species of plants recorded including 155 species of herbs, 11 species of shrubs, 36 species of trees and 18 species of herbaceous climbers (Anon. 2013; Prabhakar *et al.* 2013).

LAND USE

- Nature conservation and research
- Tourism and recreation

THREAT AND CONSERVATION ISSUES

Since the wetland is fast growing into an eco-tourism hub, substantial numbers of visitors (few are bird watchers) visit the area regularly. It is recommended that ecological ethics should not be ignored while improving infrastructure suitable to tourism. However, forest department and GNIDA implements the recommendations suggested by WWF India, coordinating agency, in this case for the management of the wetland. Some of the issues are:

1. Spread of harmful aquatic weeds
2. Excessive plantation on the periphery
3. Regular cleaning of intake canal
4. Presence of stray dogs
5. Proper disposal of litter

KEY CONTRIBUTORS

Neeraj Srivastav

KEY REFERENCES

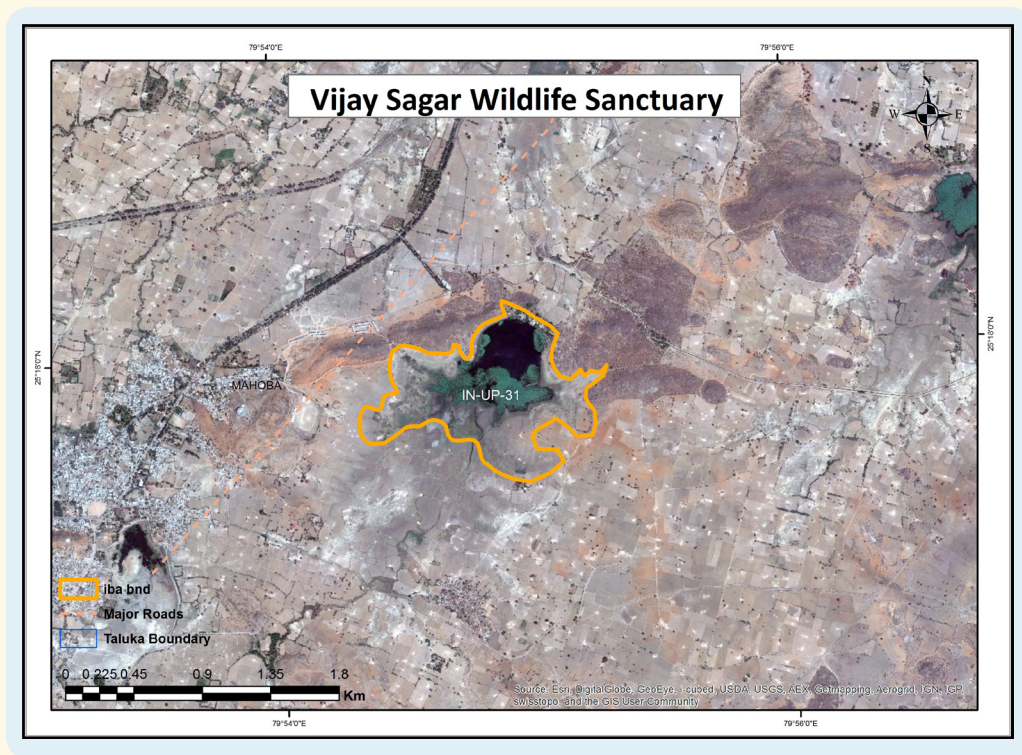
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VIJAY SAGAR WILDLIFE SANCTUARY

IBA Site Code	: IN-UP-31	Area	: 262.20 ha
Administrative Region (State)	: Uttar Pradesh	Altitude	: 214 msl
District	: Mahoba	Rainfall	: 600–700 mm
Coordinates	: 25° 15' 18" N, 79° 68' 20" E	Temperature	: 5 °C to 47 °C
Ownership	: Forest, Revenue Land, Private	Biogeographic Zone	: Gangetic Plain
		Habitats	: Freshwater Swamp (Man-made)

IBA CRITERIA: A1 (Threatened species); A4iii (>20,000 waterbirds)

PROTECTION STATUS: Wildlife Sanctuary, established June 26, 1990.



GENERAL DESCRIPTION

Bundelkhand has historically been a drought-prone region. The major sources of water in Bundelkhand are the rivers Ken, Betwa, Dhasan, Baghain, Pahuj, and their tributaries, rivulets, and seasonal nullahs. The rivers dry up during the summer months, and lakes, ponds, dug wells, and bore wells remain the only sources of water for human and animal consumption. The other source of water is rainfall. Sensing this, the ruling dynasties before the advent of colonial rulers, the Bundelas and Chandelas, had ensured the construction of an extensive network of lakes and ponds across the region, in order to minimize surface run-off after rainfall and to harvest rainwater. Mahoba was the capital of Chandela Rajputs who ruled Bundelkhand from the 10th to 16th centuries. Vijay Sagar Lake in Mahoba is one of the oldest lakes built during the Chandela period, in 1040 CE.

The Chandela King Vijaypal (r. 1035–1045) built the Vijay Sagar reservoir.

Vijay Sagar Wildlife Sanctuary was established in 1990, vide Government Order No. 1305/14-3-24/88 dated 26.06.1990. An area of 262 hectares adjoining Beejanagar Jheel and its surroundings was converted into a lake and declared a safe, no hunting zone. This picturesque area is home to around 200 species of local and migratory birds. It is surrounded by hills on its northern and southern sides, while the eastern side has an embankment and administrative block of the Forest Department. The lake is located about 6 km from Mahoba city on the Banda-Mahoba route in south-west Uttar Pradesh.

The lake is deep with shallow areas on the fringes. The waterspread expands to c. 182 ha in the monsoon. Vijay Sagar Wildlife Sanctuary is an important and well-known

bird area of Bundelkhand. It serves as a stopover site for winter migrants returning to their breeding quarters from peninsular and central India. Compared to other species, waders and marsh birds are far more abundant, sometimes in several thousands each species, and can be seen till the end of March. Vijay Sagar is mainly a rainfed lake, though connectivity with a seasonal river through a canal ensures the availability of water throughout the year.

AVIFAUNA

No systematic list or inventory of birds visiting the area is maintained, yet several visits by IBCN State Coordinator to the sanctuary have revealed that this wetland is an important refuge for avifauna, both resident as well as migrant. The sanctuary is home to more than 200 species of birds during the winter. Anatidae is the most abundant among all the families recorded. Northern Shoveller *Anas clypeata* is most numerous, followed by Northern Pintail *Anas acuta*, Garganey *Querquedula querquedula*, Gadwal *Anas strepera* Cotton Pygmy-goose *Nettapus coromandelianus*, and Common Pochard *Aythya ferina*, among others. According to a survey by SACON on wetlands of Uttar Pradesh and Uttarakhand, more than 7,000 birds of 30 species were recorded from this sanctuary. However, if we consider a large number of waders that stop over for a short time during their migration and feed on the wet marshes, the number could be much more. In a year, more than 20,000 waterbirds use this area.

Several pairs of Sarus Crane *Grus antigone*, the State Bird of Uttar Pradesh, listed as Vulnerable by IUCN, are found in and around this wetlands. The Critically Endangered White-rumped Vulture *Gyps bengalensis* is frequently sighted. The Endangered Egyptian Vulture *Neophron percnopterus* is mainly found around villages and carcass dumps.

OTHER KEY FAUNA

Vijay Sagar Sanctuary was established for the protection of waterfowl. Presently, it does not harbour mammals of conservation interest. Among the large mammals, only Bluebull *Boselaphus tragocamelus* is found in abundance

CRITICALLY ENDANGERED

White-rumped Vulture	<i>Gyps bengalensis</i>
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ENDANGERED

Egyptian Vulture	<i>Neophron percnopterus</i>
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VULNERABLE

Sarus Crane	<i>Grus antigone</i>
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Ferruginous Duck	<i>Aythya nyroca</i>
Painted Stork	<i>Mycteria leucocephala</i>

and is an important crop pest. The eastern side of the lake has some forest cover and hence occasional sightings of Leopard *Panthera pardus*, Indian Fox *Vulpes bengalensis*, a variety of snakes, scorpions, and butterflies have been reported. According to a study, 13 species of fish were present in the lake. *Heteropneustes fossilis*, *Clarias batrachus*, *Xenentodon cancila*, *Mystus seenghala*, and *Labeo rohita* are more abundant.

THREATS AND CONSERVATION ISSUES

- Poaching
- Fishing
- Drainage of water
- Pollution by unregulated tourism and cattle movement
- Infestation of weeds
- Firewood collection

Since the wetland is open and accessible to all, there is an adverse impact on the waterbody: activities like fishing and poaching go on unchecked. The wetland is used for agriculture after drainage of water. The fauna and flora, and the conservation issues affecting this potential IBA site, need to be documented. There is a need to develop and implement a Wildlife Management Plan in collaboration with the local people, so that the benefits from this historical wetland go to them and to waterbirds.

KEY CONTRIBUTOR

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